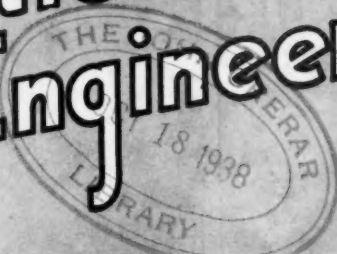


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The Refrigeration Service Engineer



Vol. 6
No. 10

OCTOBER • 1938

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November 2-3-4, 1938

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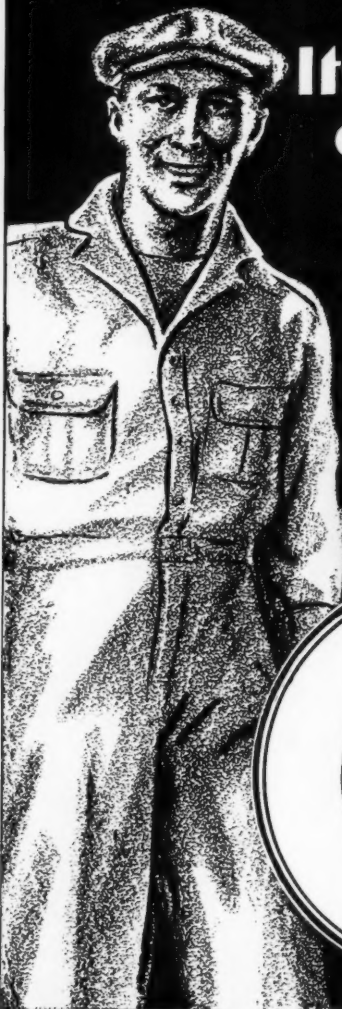
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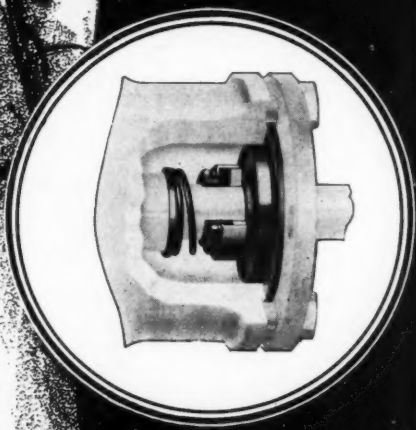
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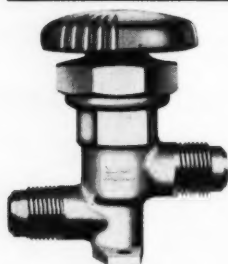
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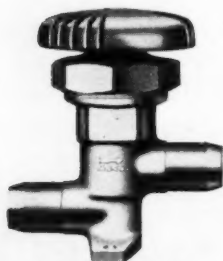
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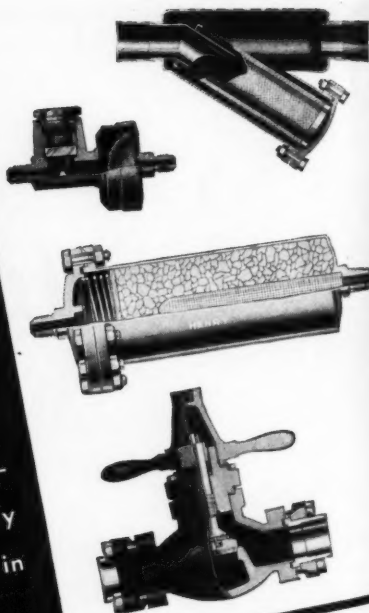
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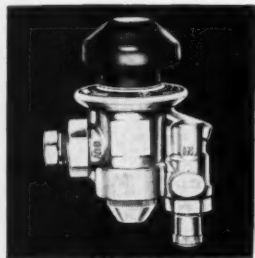
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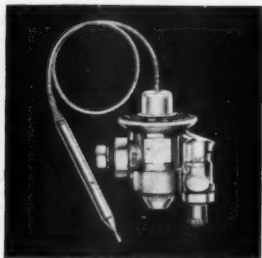


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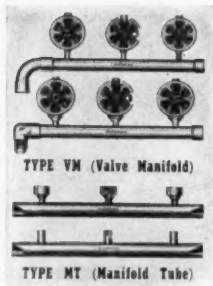
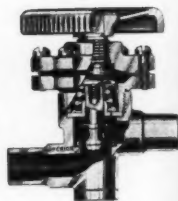
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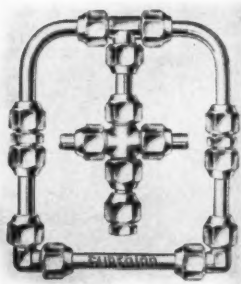
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The Refrigeration Service Engineer

Vol. 6

No. 10

October 1938

A Monthly Illustrated Journal De-
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Serving of Domestic and Small
Commercial Refrigeration Systems
and Oil Burners

Official Organ
REFRIGERATION SERVICE
ENGINEERS SOCIETY

Published by
Nickerson & Collins Co.
433-435 North Waller Ave.
Chicago

Telephones Austin 1303-1304-1305

EASTERN OFFICE
420 Lexington, New York City
Telephone Lexington 2-4816

Publishers of Technical Books and
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eration Industries for 46 years.

*Subscription Rates United States
\$2.00 per year. Single copies 25c. All
other countries \$3.00 per year.*

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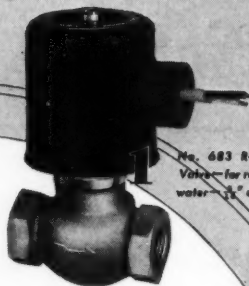
SERVICE ENGINEER

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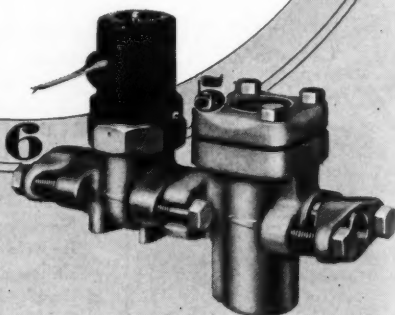
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The Refrigeration Service Engineer

VOL. 6, No. 10

CHICAGO, OCTOBER, 1938

\$2.00 per Annum

The Service Engineer and Modern Trends in Refrigeration

By P. B. REED *

IF we examine the past history and development of such popular products as automobiles, radios and mechanical refrigerators, we find common factors in all three without which they would never have been produced in the enormous quantities that they have been in only a few years. A fundamental desire by millions for fast transportation, programs and news out of the air and the convenience and economy of a mechanical refrigerator created the demand, but desire only was not enough. They had to be made at a price within the reach of the millions and their development had to follow the wishes of the purchasers. Line production is characteristically American. It is what gives us our high standard of living, conveniences common to us but enjoyed by the wealthy only of other lands, and wealth and leisure that is the envy of the world. We must bear these things in mind when examining the past and present of commercial refrigeration and air conditioning and in attempting to judge what path they probably will follow in the future.

Let us then review the history of the automobile, the radio and the mechanical refrigerator for the methods used to obtain mass

production and the general trend of public wishes that affected the development of these three products. First, however, let us mention that sales or anticipation of sales must go ahead of production. Sales volume must be built up before mass production begins. Fortunately, there is a class of people who do not wait for lower prices but buy a newly developed product even though it is expensive if they want it. This class is not composed solely of people of great wealth but rather those with incomes somewhat above the average, such as doctors, lawyers, well to do farmers, prosperous business men, those who have the pioneer spirit and who will have the latest and best for themselves and their families. They bought the Reos, Maxwells, Brushes and Studebakers in 1910, the Atwater-Kents, Zeniths in 1922, the Kelvinators, Frigidaires, Servels in 1922. They furnished the sales that preceded and made possible mass, line production.

The early automobiles were far from complete; windshield, lights, top, bumpers, starters and spare tires were all extras. These were finally all included in the one product which along with others, including closed body, made the modern automobile a self-contained device for transportation. The large, inefficient, slow speed motor whose nor-

* Service Manager, Servel Inc., Evansville, Ind.
Paper presented at Illinois Association, R.S.E.S. meeting.

mal life was short, was gradually developed into a compact, efficient, longer life motor with several times the horsepower. This was done by gradual improvements in methods of manufacture and by the use of more highly developed materials that made it possible to operate the motor at 4000 r.p.m. instead of at 1500 to 1800 r.p.m. Without the high speed motor, we would still be driving the slow, clumsy, sluggish cars of former years. The automobile was made easier to operate and control, more comfortable, more pleasing to the eye, more quiet, more dependable, more economical to operate and many of its features were made automatic. All these things line production has given us at a price of one-third or one-fourth that of the early cars.

The Early Radios

Remember the early radios; the tuner with the separate large loud speaker horn on a table, the B batteries and the storage battery on the floor underneath, and interconnecting wires everywhere. By careful manipulation of the many dials and by the help of the log that you kept of where to set them, you were lucky to get KDKA, Pittsburgh, WBZ, Schenectady and a few others and getting KFI, Los Angeles or Havana was something to brag about. For compactness, compare those radio outfits with the modern self-contained receiver that houses the tuner, speaker, automatic controls and the power-pack, all in a single cabinet. It is a complete unit in itself and requires but the press of a button or so to obtain the station you want whether it be St. Louis, New York or Los Angeles or even foreign broadcast. The modern radio is easier to install and operate, more pleasing to the eye, more quiet, more dependable, more economical to operate and many of its functions have been made automatic. And the price is but a fraction of that of a radio in the middle twenties. Line, mass production did that, too.

Many can remember the days we did not have a complete electric refrigerator to offer. We told the prospective buyer that we could install a tank or coil in his present ice box and connect it with tubing to the machine located elsewhere, usually in the basement. It also involved running wiring from the controls to the machine. A good ice refrigerator cost the user about as much as a complete electric or gas refrigerator today—\$200 or \$300. Our machine, tank, controls and installation sold for about \$700 so that by the

time he had purchased a good ice refrigerator and had installed our mechanical equipment, the customer had to spend almost a thousand dollars. The first big impetus was given the sale of the mechanical domestic refrigerators when it was made a self-contained unit complete in itself with the machine in the cabinet. This allowed it to be put on a line production basis with the consequent decrease in cost and selling price. Since that time improvements in design, materials and production methods have combined to make today's automatic refrigerator easier to install and operate, more pleasing to the eye, more quiet, more dependable, more economical to operate and many of its functions have been made automatic. Foremost among the developments that have contributed to compactness, quietness, efficiency, economy and dependability has been the marked trend toward compressors designed for and operated at higher speeds. Compare the present price with the thousand dollars of 1920. Line, mass production did that, too.

Common Trends in Development

In reviewing the developments of these three devices, we recognize several that are common to all three: self-contained, easier to operate, more pleasing to the eye, more quiet, dependable, more economical, more fully automatic and much lower in price. In addition, "easier to install" applies to both the radio and the mechanical refrigerator. Let us not forget that combining all the parts and functions in one enclosure, that is, making it self-contained and more compact was a vital factor in drastically reducing the price as it permitted line production with consequent reduction of costs.

Commercial refrigeration is now passing through the transition stage as to compactness and completeness. More and more manufacturers of market fixtures, water coolers, beverage coolers, ice cream freezing, hardening and storage cabinets, dispensing fixtures and many others are including the machine unit in the fixture in order to obtain compactness and enable them to furnish their product complete, put it on a line production basis and reduce the total price at which the complete installation can be sold to the ultimate user. The dealer's problems are simplified as the package job is more merchandisable and is more easily installed by less experienced mechanics. Moreover, the user looks with favor on the complete self-

contained product. He has learned to distrust the "Christmas tree" installations that have several fixtures with as many temperatures carried on one machine. The future will probably see this tendency toward self-contained fixtures carried still further in commercial refrigeration.

Air conditioning began in much the same manner as household electric refrigeration and commercial refrigeration did, the gathering together and installation of several individual units, the machine, the lowside, the controls and the connections. In other words, the installation was largely built on the job. No doubt for large tonnage installations this will continue but we can reasonably expect that the large volume of installations involving less than 10 tons, and that is where the big field is, will respond to the same factors that affected the volume sale and manufacture of automobiles, radios and domestic refrigerators. We can expect the self-contained trend to be a big factor, that emphasis will be placed on making the equipment more compact and more easily installed, easier to operate, more pleasing to the eye, more quiet, more dependable, more economical to operate and more fully automatic.

Classifications of Air Conditioning

Broadly speaking, the types of establishments to be air conditioned may be divided roughly in three classifications—1. Commercial establishments. Included in this are stores, theatres, general offices, hotels, funeral parlors, banks, sales rooms, auditoriums, restaurants and churches. 2. Individual rooms including small offices, hotel bedrooms, hospital rooms and small apartments. 3. Residences.

In the large installations of the first classification, that of commercial establishments, the especially engineered installation will continue to be most general although it is not unlikely that some development along the line of a semi-self-contained unit will be made. In the smaller installations of this classification the self-contained unit is increasing in popularity due to the ease and economy in making the original installation. Also, it lends itself to cost reduction of the equipment due to the possibility of line production. As these larger sizes of self-contained units are made more simple to install, more compact, quieter in operation and more harmonious with the surroundings, the trend toward them will be more pronounced.

Obviously, the answer to the problem of

air conditioning the individual room of classification number two is the self-contained unit of one or two tons capacity. The same factors will apply to its development as applied to the larger self-contained units mentioned in connection with small commercial establishments. Although there are some undesirable features of the small self-contained unit or room cooler as it is sometimes called, such as lack of provision for conditioning fresh air brought in and poor control of circulation, these can and doubtless will, be overcome as further developments are made in this field. There is probably no modern convenience that is more in the public mind today and more generally desired than air conditioning. Why, then, are not more homes air conditioned as this classification has the greatest potential volume of any other classification? Today the answer is that only the wealthy can afford to air condition their homes. Even the pioneer buyers who purchased the early automobiles, radios and mechanical refrigerators have not as yet gone very strongly for air conditioning in their homes. Even the man of above average means is hesitant about spending approximately four hundred dollars a room to air condition his home, even two or three rooms of it. There will perhaps be a few who will be content to air condition one or two rooms with room coolers but few wives—and their preferences are going to be a most important factor in home air conditioning, are not likely to agree to a self-contained conditioner in their tastefully furnished and decorated room.

The buyer of home air conditioning equipment will probably prefer a remote type installation, but such an installation is beyond his means at \$400 per room of which, incidentally, seventy-five to one hundred dollars per room is installation and engineering cost. To air condition four rooms would cost them fifteen or sixteen hundred dollars. They probably could be persuaded to spend eight hundred dollars. How, then, are we to cut in half the cost of air conditioning the home? Obviously it must be done in the same manner in which the price of domestic refrigerators was reduced—by putting it on a line production basis to reduce cost. But how are remote, complete installations to be put on a line production basis? First, by means of a completely or semi-completely contained unit designed to be placed beside the warm air furnace and connected to its air duct system. Installation will be comparatively simple, re-

quiring only connection of water, drain and electric lines. Such a unit as well as similar units for larger commercial installations can be made by line production methods and costs considerably reduced. There are some problems in obtaining proper air circulation from warm air registers located in or near the floor but late developments in directional grilles or the use of small cross-sectional ducts that may be pushed up the wall to obtain an outlet grille a few feet from the floor promise inexpensive solutions to this problem.

Necessities of Future Design

But the furnace unit alone is not enough. The size of the refrigerating machine must be reduced not only for compactness for the furnace unit and for room type self-contained conditioners, but also to reduce cost. To do this, we must take a cue from the automobile industry and take advantage of improvements in processing methods and developments and design our compressors for much higher speeds. Isn't it rather ludicrous that automobile motors are operated at speeds of three or four thousand r.p.m. and we poke along at only a few hundred r.p.m. or even as in a few cases, at electric motor speed of 1750 r.p.m.? We are back where the automobile motor was twenty or thirty years ago. For our industry to crack the immense air conditioning market by reducing prices and costs, the high speed compressor is inevitable. At the same time, it gives us more efficient and quieter operation, lower operating cost, longer life and occupies less space. There is all the difference, however, between speeding up a compressor and designing a compressor for high speed. Obviously, a compressor designed to operate at four or five hundred r.p.m. will soon wear out if speeded up to a thousand r.p.m. but if we design and build a compressor like a modern automobile or airplane motor with forced feed lubrication, copper-lead or other good anti-friction bearings, honed cylinders, precision made and closely fitted parts, there is no reason why the compressor cannot be run at least two or three thousand r.p.m. Not to take advantage of modern methods of manufacturing and newly developed materials is simply foolish. Some manufacturers have made a great deal of progress in developing high speed compressors and much more along this line can be expected within the next year or so.

What effect does all this have on us as

servicemen? Those of us who installed electric refrigeration in the early twenties, did our own wiring and plumbing, ran our own tubing and in fact did the whole installation ourselves. Much of that work has been taken from the refrigeration man and in addition the increased popularity of the package type installation has still further conspired to limit the scope of his activities so that today in many localities his only connection with the original installation is to open the valves and plug in the electric connection. Most of the serviceman's activity is in "trouble shooting." All evidence points to an increase in this tendency.

Requirements of the Service Engineer

From the foregoing we might deduce that the serviceman is becoming less important and that the demand for his services is decreasing. Such is not the case, for although equipment is being so improved in design and in manufacture that less service is required, the number of units in use is constantly increasing. Applications are much more diversified. For example, fur storage with their two speed machines, apple storage, locker storage, large water cooling installations for carbonated beverage plants, small packing houses, industrial processing installations and many others that the advent of the larger horsepower machines has brought within the scope of our industry. In some respects installations are more complex, requiring a broader and yet more intimate knowledge on the part of the serviceman than ever before. Instead of the serviceman becoming less important, his importance is increasing but also his responsibilities are greater than ever before. He must cease to be a mechanic only. He must take on more of the functions of an engineer. To successfully service an air conditioning installation, he must know not only the refrigerating system, but he must be able to check the possibility of incorrect duct design, he must understand proper air distribution and he must be familiar with the properties of moisture in the air. He must, for example, understand fully why, even with the refrigerating system operating perfectly and at full capacity the dry bulb temperature in the conditioned space cannot on some days be brought below the outside dry bulb temperature. Air conditioning is not more complex than other applications to which refrigerating machines are put. In some ways it is much simpler than many food preservation

applications but it does open new fields and calls for an adequate understanding of more varied control systems and auxiliary equipment perhaps not met with previously in refrigeration service experience.

The industry is badly in need of application engineers, men who compute the load, choose the equipment, lay out the job, design the duct work for a balanced air distribution and supervise the installation to its completion and turn over to the customer a job that will perform in a manner that was promised to him. The serviceman has an ideal basis of practical experience for becoming an all around refrigeration and air conditioning application engineer and it may be that the term "service engineer" can be broadened and expanded to include application engineering as well as service engineering.

We have chosen the name of "Refrigeration Service Engineers" for the personnel of our industry, implying that its members are

engineers. It behooves us all to live up to that implication and to equip ourselves to make that name a reality. Let us discard "rule of thumb" methods and replace them with a better understanding of basic principles. There are several subjects with which we should be more intimately familiar such as electric motors and controls, the temperature-pressure relationship of refrigerants, total heat values of refrigerants in different parts of the system particularly the evaporator and especially in air conditioning and refrigeration of foods, and the properties of moisture in air. We would all benefit immensely by laying out for ourselves a definite program of self-education on these and other subjects and establishing a routine of a definite number of hours per week in systematic study. By so doing, we can raise our individual and collective standing in our industry and increase our value to our public and consequently our compensations.

The Gilfillan Refrigerator

THE first model of the Gilfillan refrigerator, manufactured by Gilfillan Bros., Los Angeles, Calif., was placed on the market in 1931. In general design of compressor, the unit has not changed from that date to the present time. Minor changes have occurred, which have increased the dependability and efficiency of the machine, but these changes do not effect the service methods employed on the unit.

These units are of the two-cylinder, reciprocating, belt-driven type. The cylinders are arranged in a horizontal opposed position, and the two pistons are combined in one casting, driven through an eccentric from the compressor shaft. The compressor, or cylinder heads, are detachable and contain both the suction and discharge valves in the Model 1937 unit. Earlier units contained no suction valves, but utilized a suction port in the cylinder walls.

One unusual feature of all units is the cartridge-type discharge valve used in the compressor head, which makes it unnecessary to remove the head to repair or replace the discharge valve.

Evaporators are of the continuous-tube, direct-expansion type, employing an expansion valve as a liquid control. Thermostatic expansion valves were used on a few models made in 1937. All others were automatic expansion valves.

Well-known makes of thermostats have always been used as a motor control.

OIL, REFRIGERANT AND BELT DATA

Year	Model	Refrig.	Lbs.	Oz. Oil	Belt Size
1931		SO ₂	3½	82	36x½
1932	A	"	1½	12	35x¾
1933	C	"	1¾	12	35x¾
1934	C	"	2	16	35x¾
1935	C	"	2	16	35x¾
1936	D	"	3½	16	34x½
1936	E	"	3½	16	34x½
1937	F	"	3½	16	34x½

The usual instructions for the location, installation and starting of the machine apply to this unit. The machine must be located where plenty of ventilation to the unit is available, and where heat from the kitchen range and radiators will not have too much influence on the refrigerator. Shipping bolts

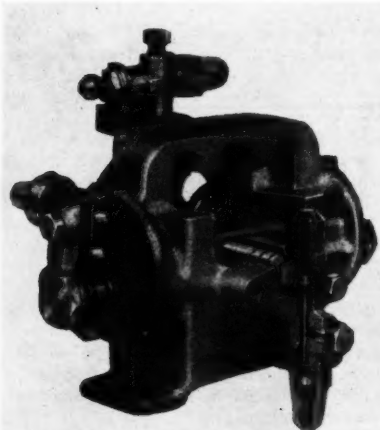
must be removed, permitting the unit to float freely on its spring mountings. Valves must be opened before starting the unit.

Service Instructions

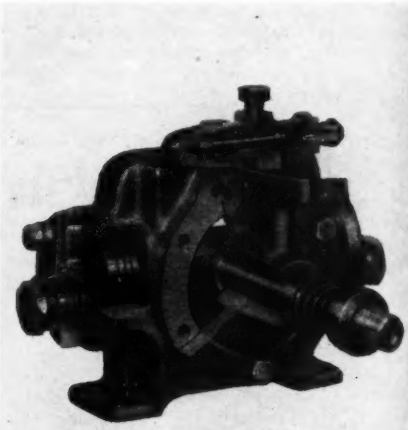
Adjusting the Expansion Valve

Never try to adjust an expansion valve when the machine is first started. If the expansion valve is set while the evaporator coil is warm, it will likely be found incorrect when the evaporator coil is chilled. The check of the proper setting of an expansion valve should always be made when the evaporator coil is frosted and the equipment is in normal operation; that is, the compressor having been in operation long enough after an idle period, so that the back pressure of the idle period has been removed. Never force any equipment to operate by heating

inches of vacuum and on cabinets equipped with four-tray evaporators, reading should be four inches to five inches of vacuum. Thermostatic expansion valve suction pressures vary with the temperature conditions and if the suction line is not frosted back and there is no apparent expansion valve trouble, the back pressure indicated on the gauge could be anywhere from zero to as much as 18 inches vacuum, at varying times without necessarily indicating any trouble at this point. In any event, when the setting is correct, the coil will be frosted completely back to the last coil, and should not frost outside of the cabinet at any time. This condition should be attained regardless of the vacuum reading on the gauge, as it is essential that the coil be entirely frosted for best operation. When evaporator coil



FRONT VIEW OF GILFILLAN COMPRESSOR ASSEMBLY.



REAR VIEW OF COMPRESSOR ASSEMBLY.

the thermostat, or short circuiting the receptacle, and expect to get a normal reading of the pressure on the low side. Frequently it requires some time to wait until the equipment starts normally; that is, by the refrigerator having warmed enough to throw the switch of the thermostat, but it is the only way to be sure of the setting.

1. Put on the compound gauge.
2. Start the motor and allow the machine to operate for a few minutes.

3. In cabinets equipped with two-tray evaporators, compound gauge reading should be seven inches to eight inches of vacuum; cabinets equipped with three-tray evaporators, reading should be six inches to seven

inches of vacuum and on cabinets equipped with four-tray evaporators, reading should be four inches to five inches of vacuum. Thermostatic expansion valve suction pressures vary with the temperature conditions and if the suction line is not frosted back and there is no apparent expansion valve trouble, the back pressure indicated on the gauge could be anywhere from zero to as much as 18 inches vacuum, at varying times without necessarily indicating any trouble at this point. In any event, when the setting is correct, the coil will be frosted completely back to the last coil, and should not frost outside of the cabinet at any time. This condition should be attained regardless of the vacuum reading on the gauge, as it is essential that the coil be entirely frosted for best operation. When evaporator coil

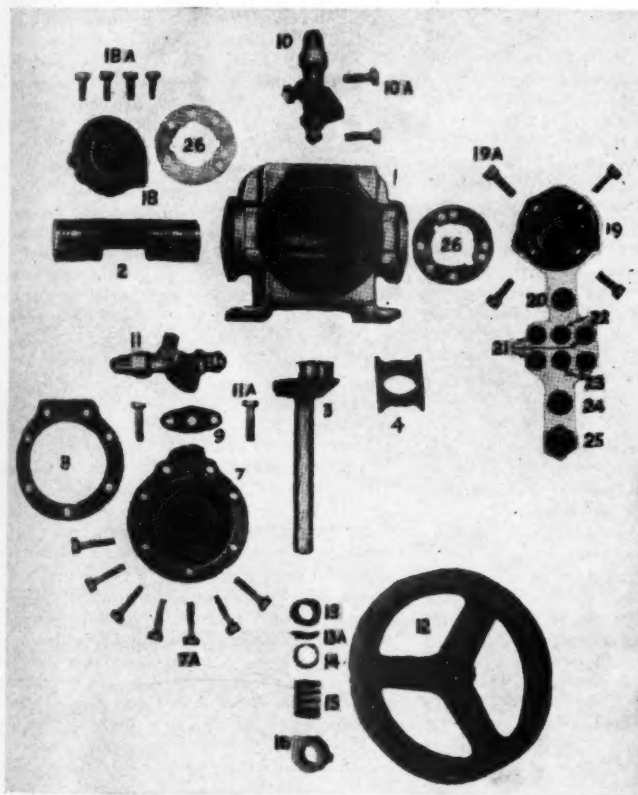
is not frosted all the way back, remove cap from evaporator valve adjustment screw and with screwdriver turn the adjusting screw one-quarter turn to the right, or clockwise. Close refrigerator door and check in three or four minutes and see if coil has frosted up to proper extent. If not, screw valve as above described another quarter turn. If coil has frosted too far with first adjustment, turn screw to left fraction of turn, close door for several minutes and check again. Never turn the adjustment screw more than a quarter turn at any one time. Be sure that all plugs and caps are replaced tightly, and shut-off valves are tightly closed.

Some 1937 models will be equipped with thermostatic type of expansion valve instead of the automatic manual adjustment type. This type valve is different in that the adjustment of the valve is accomplished by the expansion and contraction of the gas within the power element which is hermetically sealed. The contact tube is fastened to a point several inches before the suction line from the evaporator passes through the cabinet wall. The purpose of this contact

erly and this should be checked in cases of frost-backs and other faulty operation.

Flushing the Expansion Valve for Leaking

A small amount of dirt or grit may sometimes lodge on the seat of the expansion valve, thus allowing liquid sulphur dioxide to leak through when it should be shut off. If the valve can be held off its seat for an instant, the liquid rushing through will very often remove the dirt. This is called flushing the evaporator valve.



DESCRIPTION OF PARTS— MODEL "F" COMPRESSOR

1. Compressor Housing or Body.
2. Twin Piston.
3. Drive Shaft.
4. Eccentric.
5. Eccentric Strap.
6. Piston Pin.
7. Compressor Seal Flange & Bearing Assembly.
- 7a. Cap Screws.
8. Compressor Seal Flange Gasket.
9. Line Valve Gasket.
10. Suction Line Shut-off Valve.
- 10a. Suction Line Cap Screws.
11. Condenser Line Shut-off Valve.
- 11a. Condenser Line Cap Screws.
12. Compressor Fly Wheel.
13. Steel Seal Ring.
14. Seal Gland Packing Ring.
15. Seal Gland Spring.
- 15a. Seal Gland Thrust Ring.
16. Seal Retaining Collar.
17. Suction Flapper Valve.
- 17a. Suction Valve Retaining Screw.
18. Compressor Valve Head Assembly.
- 18a. Compressor Head Cap Screws.
19. Compressor Valve Head Assembly.
- 19a. Compressor Head Can Screws.
20. Discharge Valve Seat.
21. Discharge Valve Tension Discs.
22. Discharge Valve Disc.
23. Discharge Valve Spacer Discs.
24. Retainer Cage for Discharge Valve.
25. Discharge Valve Retainer Cage Seal Cap.
26. Compress Head Valve Gasket.

is to stop the frost line at this point, preventing frost-backs to the compressor. It also permits the change of adjustment which is required in changing seasons or altitudes. It is very important that the contact tube be very securely fastened to the suction line. If it is not secure it will not function prop-

1. Put on the compound gauge.
2. Turn the liquid receiver shut-off valve all the way to the right.
3. Start the motor and pump a vacuum of at least twenty inches.
4. Stop the motor.
5. Open the liquid receiver shut-off valve

about two turns for a few seconds and then close it. This will allow the liquid Sulphur Dioxide to rush by the valve seat, flushing it of dirt.

6. Repeat the above operations several times.

Testing the Expansion Valve for leaking

1. Put on the compound gauge.
2. Turn the L.R.S.V. all the way to the right.

3. Start the motor and pump a vacuum of at least twenty inches.

4. Turn the compressor discharge shut-off valve all the way to right. Stop the motor. This should be done at the same time.

5. Open completely the liquid receiver Service Valve and allow the full pressure of the liquid to flow to the expansion valve.

6. If the valve does not leak, the pressure on the compound gauge will rise slowly to one or two pounds more than the regular setting given above. This pressure will not stay long at this point, but will gradually rise due to the natural expansion of the Sulphur Dioxide in the evaporator coil. If the valve leaks, the pressure on the compound gauge will rise rapidly to approximately the condensing pressure. If flushing the valve as instructed above does not remedy this, it is necessary to replace the expansion valve.

Temperature Regulator

If this temperature regulator has been determined to be defective, it should be removed and returned for replacement. To check proper operation of same, place a pencil thermometer in the ice freezing sleeve and with temperature control button set at No. 1 position. The machine should cut out at 14 degrees and should cut in at 26 degrees. Moving this button to the right lowers the cutting out temperature one degree for each setting. Moving it to the left raises the cutting out temperature one degree for each setting. The cutting in temperature will be 12 degrees higher automatically.

Check very carefully the contact between the temperature control tube and the evaporator coils, as it is very important that this tube have good contact with the evaporator, and it should be fastened at any point between the last and third from last coils of same. If this tube is not in firm contact with the evaporator coil, erratic operation will result.

Incorporated in the temperature control is a circuit breaking device which is actuated by a small heater coil, and, in the event of the motor becoming overloaded, will discon-

nect the electric supply at the switch. Very frequently this will be found to be trouble of an electrical nature, sometimes due to a tight belt or a stiff compressor. This trouble should be corrected before attempting to start the machine.

Compressor

The Gilfillan compressor is the design known as the "horizontal opposed reciprocating" or piston type. It consists of 3 principal moving parts; namely, the shaft and eccentric connecting rod and wrist pin and piston. The cylinder housing eccentric and piston is all made of special alloy casting finely machined to extremely close limits or measurements. The shaft is driven by means of a grooved fly-wheel and belt. Gas is drawn into the cylinder through flapper type intake valves mounted on the cylinder heads. Discharge valves are special Gilfillan design—contain no coil or leaf springs and are assembled in a cartridge in each cylinder head mounted on the ends of the compressor body. Each head is a complete unit containing both suction and discharge valves and there is a right and left head which must be considered when adjustments are made.

To determine if discharge valves are leaking, insert pressure gauge in compressor discharge shut-off valve. Turn off switch so machine cannot operate and turn compressor shut-off valves all the way to right. If pressure drops rapidly on gauge, valves are leaking. If drop is very slow, it does not necessarily mean that valves are leaking badly enough to necessitate a change. Experience alone can guide you in most cases.

To test suction valve screw compound test gauge into liquid receiver shut-off valve. Turn off switch so machine cannot operate, turn shut-off valve all the way to right, closing compressor off from evaporator. Now start machine and run until zero is indicated on the gauge. Then shut it off again. If the pressure from the high side of the system is leaking back through the suction valves, gauge will mount up rapidly. If a new pair of heads are not available, remove suction valve flappers and lap in same manner as seal. It is not advisable to remove the discharge valve assembly from cage as it requires special tools to do this and you are apt to mutilate these parts.

To replace heads leave compressor shut-off valve closed as above and also close compressor suction shut-off valve all the way to right. Then remove four cap screws fastening heads to compressor body at each end.

A slight amount of SO_2 will escape but this is not sufficient to interfere with operation. Replace with new heads making sure gaskets are not injured and right and left sides are in proper place as regards (port) openings in gaskets, heads and compressor body.

Important

1937 model compressors must be rotated only in counter-clockwise direction when fac-

ing the front of refrigerator. Revolving the flywheel in the opposite direction will sometimes cause the crankshaft to become unscrewed from the eccentric. Generally, if this happens, the shaft can be reset by revolving it in the proper direction which should be done in every case where you have knowledge that the compressor has been turned in the wrong direction.

Fifteenth Article

Air Conditioning

In Which the Author Describes the Proper Method of Installing and Checking the Standard Air Conditioning Unit

By W. C. FARMINGDALE

IN last month's article we learned how the S.A.C. Model 559 was built and how the various parts in the unit operate. We learned that this portable room conditioner, as well as cooling and drying the air, brings in fresh air in quantities from 0 to 250 cubic feet per minute, that up to 100 c.f.m. of stale used air can be exhausted from the room while cooling is on, that 310 c.f.m. of stale air can be exhausted from the room while cooling is off and that all air that enters the room is filtered.

This article will describe the necessary steps to properly install and check the operation of the various parts of the system. This article will describe the installation of portable air conditioning equipment and how it has been reduced to a simple, easy procedure that requires a minimum of tools and time. Two men can install a Model 559 in three hours time without rushing. This quick installation has been made possible by the elimination of practically all cutting and fitting of parts on the job.

Because the Model 559 weighs about 450 pounds, the installation team should be made up of two men. The two men should work together as a team. One man will uncrate the various parts and get the mechanism in operating order while the other man fits the window board into place and hooks up the fresh air duct. Thus by splitting up the work the job can be done very quickly.

The unit is shipped in a wooden "wrap-around" crate which can be easily removed from the unit. When the crate is removed, the current and voltage specifications of the unit should be checked by examining the serial number plate that is attached to the left rear of the unit. The next step is to check the three service valves (head, suction and receiver) to see that all valves are open. The location of these valves is shown in Fig. 1.

After the current, voltage and valves are checked, the two motors should be oiled with a good grade automobile oil No. SAE 20.

The compressor is mounted on four springs. In shipping, however, the compressor has to be locked in position to prevent it from shifting, which is done by three clips which go around the springs. Then the compressor chassis is bolted down to these clips. Before the compressor can be started, these clips and bolts must be completely removed. To do this, first remove the bolts from each of the three springs that are surrounded by clips. Then spread the cut in the clip with a screw driver and force the clip away from the spring. It is good practice to tie the clips and the bolts together in a bag and leave this bag of parts under the conditioner so they will be available in case the customer wants to move his equipment at some future time.

Installing the Window Piece

The S.A.C. Model 559 can be quickly and easily installed in ordinary double hung windows. In case a radiator or some other encumbrance prevents the unit from sitting tight against the window, the duct connection can be made by means of a series of snap-on ducts.

The window piece is made of $\frac{3}{8}$ inch sound absorbing fibre board 19 inches high by 48 inches wide. In the center of this board is located a weather louvre which allows air to flow into and out of the unit without allowing rain or snow to enter. This weather louvre is really four separate louvres in one frame. In Fig. 2 you will notice that the

heights less than 27 inches a special "H" shaped sheet metal channel can be made to join the standard filler panel with another piece of $\frac{3}{8}$ inch fibre board to make up the required height.

How to Install the Window Filler Piece

The height of the air duct which connects the back of the conditioner to the window filler piece will be affected by the way in which the filler piece is cut. In general, the conditioner as a unit will look best when the top of the air duct is flush with the top of the discharge grille on the cabinet. This most pleasing effect can be obtained by making the distance from the floor to the bottom

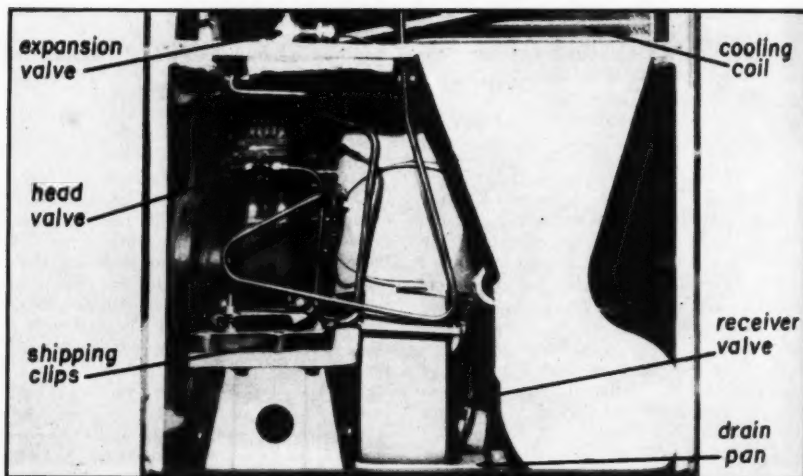


FIG. 1. SHOWING THE S.A.C. 559.

vanes on the louvre do not go entirely across the face of the louvre. Rather three splitters break the louvre up into four independent louvres. This is done to prevent the incoming air from short-circuiting with the outgoing air. The three splitters in the louvre line up with the three splitters in the duct and so keep the four streams of air that enter and leave the conditioner separated.

With the filler piece provided, the S.A.C. Model 559 can be installed in double-hung windows whose sill heights vary from 27 inches to 35 inches high. On windows whose sills are higher than 35 inches, a wooden platform can be built to raise the entire unit to the desired height. On windows with sill

of the air duct or louvre $35\frac{1}{2}$ inches. In order to do this, measure the distance from the floor to the bottom sash stop on the window (see Fig. 3). Then subtract this measurement from $35\frac{1}{2}$ inches and this will give you the distance from the bottom of the louvre to the bottom of the filler panel. Cut the filler panel to obtain this dimension. For example, suppose that the distance from the floor to the sash stop measured $30\frac{1}{2}$ inches. Subtract this from $35\frac{1}{2}$ inches and you'll get 5 inches. Lay off 5 inches from the bottom of the louvre towards the bottom of the panel. Then cut the panel along this 5 inch line. (See Fig. 3.)

Two $\frac{3}{8}$ inch channels 19 inches long are provided to hold the filler panel in the win-

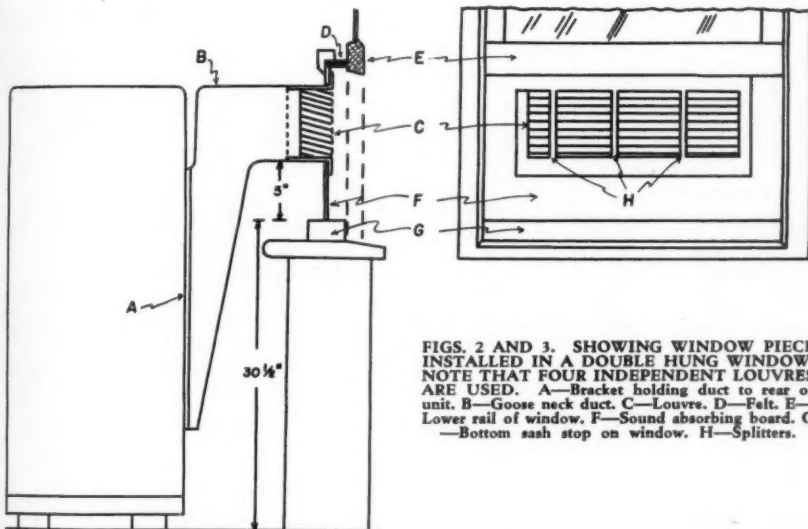
dow. Cut these channels to the new height of the filler panel. Then screw them to the side jambs of the window $\frac{3}{4}$ inch from the lower rail of the window. When the filler piece is installed and the window is opened, the felt at the top of the filler panel will press tightly against the lower rail of the window.

After these channels are fastened to the side jambs of the window, slide the filler panel in between these channels. An "L" shaped piece of sheet metal is provided to finish off the lower edge of the filler panel where the panel has been cut. Cut this piece

of moisture that might pass through the condenser from the condenser-fan. This pan returns the water to the lower condensate pan and hence prevents water from leaking onto the floor. The splash pan must be installed before the conditioner is backed up to the "goose-neck" duct because the duct covers the splash pan.

Connecting the Conditioner to the Window

Now take the "goose-neck" shaped duct connection and push it onto the louvre. In case a radiator, a wide sill or some other obstruction prevents the duct from engaging the louvre, clip on one or more 3-inch duct



FIGS. 2 AND 3. SHOWING WINDOW PIECE INSTALLED IN A DOUBLE HUNG WINDOW. NOTE THAT FOUR INDEPENDENT LOUVRES ARE USED. A—Bracket holding duct to rear of unit. B—Goose neck duct. C—Louvre. D—Felt. E—Lower rail of window. F—Sound absorbing board. G—Bottom sash stop on window. H—Splitters.

of "L" iron to fit between the channels on the window so that it will rest on the bottom sash stop of the window. Then fasten the filler panel into its channels and fasten the "L" shaped iron to the filler panel. In order to keep out a lashing rain, fill the small space around the "L" shaped iron on the outside of the window with putty.

The window connection is now made and the conditioner is ready to be installed at the window.

Installing the Splash Pan

In the bag of parts you'll find a splash pan painted a battleship grey color. This must be screwed to the two angles that protrude from the center part of the condenser. This splash pan is used to catch any particles

extension pieces to the duct to make up the space between the louvre and the duct. Then clip the duct and its extensions onto the louvre. A rubber gasket is provided to make an air-tight joint between the louvre and the duct. This must be placed on the duct before it is forced onto the louvre. Each individual extension piece should be bolted to the duct or to its adjacent extension piece through the two slots provided, to prevent it from leaking air.

After the "goose-neck" duct is attached to the window louvre, the conditioner should be shifted into place in front of the duct and be worked carefully up against it. Then the two 20 inch pieces of brown steel should be secured tightly to the studs that project from either side of the condenser on the

rear of the conditioner. A rubber gasket on the face of the "goose-neck" duct insures an air-tight connection between the duct and the unit.

Installations in Walls

Sometimes a Model 559 will have to be installed in a wood or brick wall. When this is done a hole will have to be made in the wall and a special duct will have to be fabricated to go through the wall. This duct will have to have three splitters to line up and make an air-tight connection with the

moved. These legs are made of balsa wood and act as a sound-absorbing cushion under the unit. Because of the low strength of balsa wood the unit should not be dragged around the room or else the balsa wood may split.

It is essential that these legs be installed because the recirculation air damper is located under the unit. If the legs are not used, the damper will always remain closed and the unit will not cool room air.

To install the legs, first unscrew the four nuts that hold the unit to the floor of the

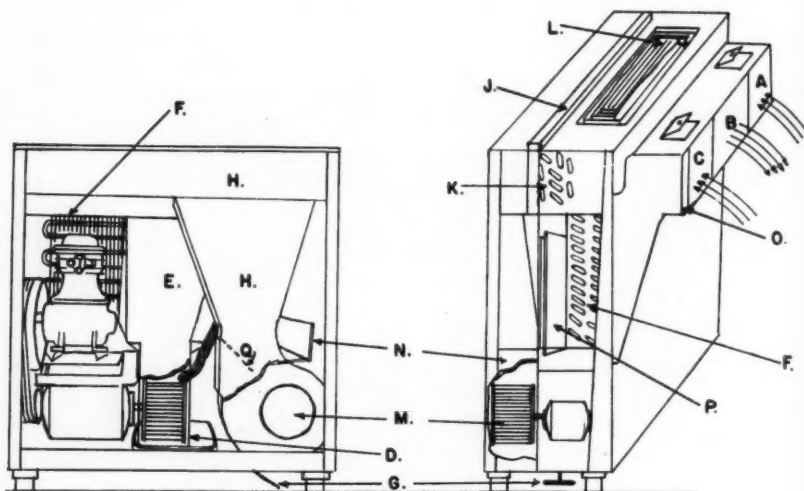


FIG. 4.—ILLUSTRATING THE S.A.C. MODEL 559

A—Intake air duct
B—Exhaust air duct
C—Intake air duct
D—Condenser fan
E—Condenser air duct
F—Condenser
G—Room air damper

H—Room air duct
I—Filter
K—Cooling coil
L—Directional grill
M—Room air fan
N—Fresh air damper

O—Fresh air duct
P—Ventilation damper
Q—Discharge damper
R—Liquid line to coil
S—Compressor motor
T—Receiver in drain pan

splitters in the duct and in the louver. The louver supplied in the filler board that comes with the unit should be installed with copper flashing so as to make a weather-tight installation. It is recommended that the original louver be used so that the air currents in the duct won't short-circuit and interfere with the proper operation of the unit.

The S.A.C. Model 559 is shipped in a wooden "wrap-around" crate. The conditioner is bolted to the floor of this crate by four nuts and bolts.

Four legs are shipped with the 559 to be installed after the floor of the crate is re-

crate. Then use the four nuts and washers that were removed to screw the legs onto the unit. The 559 is equipped with a skirt that hooks onto the lower edges of the chassis and covers the legs. This skirt is constructed like a louver so that little or no restriction is offered to the flow of room air through the skirt to the recirculation air damper.

Check the Operation of the Dampers

After the unit is in place, the various dampers should be checked to be sure they operate properly. If one of the dampers

should leak, the cooling capacity of the unit will be reduced materially.

Let us review for a moment how these various dampers work so that we can understand how to check them.

In Fig. 4, ventilation air (while cooling is on) enters the unit through duct (O) and passes downward through damper (N) to fan (M). Fan (M), as well as drawing air through duct (O), draws air from the room through floor damper (G), and then passes these two streams of air upward through duct (H), through the filter (J), and thence into the room through grill (L). When damper (N) is closed outside air cannot get to the fan and hence no fresh air can enter the room.

When Ventilation Is Required

Thus, when cooling and ventilation are desired damper (N) must be wide open. Damper (N) is controlled by a small Bakelite knob at the extreme left of grill (L). To check damper (N) push the Bakelite knob toward the window. Then damper (N) should stand almost vertical. Now pull the knob back and the felt on damper (N) should strike on the metal damper stop.

Damper (G) is operated by a lever at the right rear of the cabinet. When cooling is on, damper (G) should be wide open (down towards the floor) so that room air can flow into the fan (M). All the time that cooling is on, the control lever should be in the vertical position.

When this control lever at the right rear of the cabinet is pushed to the right, damper (G) should be pulled up tight and damper (P) should open. Now the cooling machine should be shut off and damper (N) should be opened. In this position the 559 is ready to supply 250 c.f.m. of fresh air to the room. Let's see how it works. Fan (M) draws air through damper (N) through section (O) of the duct. It also draws air through damper (P), through the condenser, through sections (A) and (C) of the air duct, or, in the reverse procedure, fresh air is drawn from outside through ducts (A) and (C) through the condenser, through damper (P), through the fan and is discharged upward through the duct (H) into the room. In this position we want fresh air only and hence damper (G) should be closed. Now when the lever is set back to a vertical position, damper (G) should drop wide open and damper (P) should snap closed tightly. If damper (P) should stick

open, the fan (M) would tend to pull some air from the machinery chamber and pass it into the room through the cooling coil. Because this air passes through the condenser (which is hot when cooling is on) a leak at damper (P) would impose a large load on the system and thus cause a loss in cooling effect in the room.

When the control lever is pushed all the way to the left and the cooling machine is shut off, the 559 is ready to remove 310 c.f.m. of stale air from the room. In this control position, damper (Q) inside duct (H) is revolved upwards to close off duct (H), and thus prevent air from passing upward into the room. Damper (G) is wide open and all other dampers should be closed. Now fan (M) pulls air from the room through damper (G), and discharges it into the machine compartment through damper (Q). From here the air passes out of the unit through the condenser and sections (A) and (C) of the air duct.

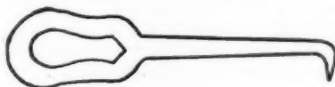
If damper (Q) does not open up wide, some air will pass upwards into the room and little exhausting will occur.

Now when the control lever is brought back to the vertical position again damper (Q) should snap closed. If damper (Q) should remain partially open, some of the room air handled by fan (M) would leak into the machine compartment and be lost. Thus a large amount of comparatively cool room air would be removed from the room and cause a large amount of warm outside air to leak into the room around doors and windows.

Dampers (G), (Q) and (P) can be adjusted by moving the armor on the control cables. To do this loosen the clips that hold the armor in place and move the armor in or out of the clip about $\frac{1}{2}$ inch. Retighten the armor and try the damper.

PACKING HOOK

A HANDY tool for removing the old packing in refrigerator service valves can be made from an old buttonhook, as illustrated in the accompanying sketch.



Take any size buttonhook, cut off the old hook and sharpen the end to a sharp point. Then, bend the end at right angles, as shown.

Selecting Alternating Current Motor Capacitors

In the September issue under this heading the author described the purpose, construction and means of testing capacitors.* In this article factors governing their selection are discussed.

By WALLACE N. KEY*

THE non-polarized capacitor, or a.c. capacitor, has found one of its greatest applications in the field of capacitor motors, where the motor is operated under intermittent conditions, such as oil burners, electric refrigerators, and other fractional horsepower operated devices.

The electric refrigerator must have a motor of special requirements, and one of these requirements is a high starting torque. The first motors built for this purpose were of the repulsion-start, induction-run type which employed a wound rotor, a commutator and a brush mechanism. These motors were large and heavy and cost considerably more to manufacture due to the additional windings and parts required. Through the use of a capacitor it is possible to construct a motor with the necessary characteristic of a high starting torque and at the same time reduce the size, weight and manufacturing cost. Due to their increased power factor, capacitor motors will also operate more economically.

The windings of the single-phase capacitor motor are the same as the two-phase induction motor, but in the single-phase motor, an automatic switch, or relay, must be used to disconnect the capacitor when the motor has reached its rated speed.

When a two-phase motor is connected the same as a single-phase, with a capacitor in series with one of the windings, it will operate the same as a single-phase capacitor motor. Also, the two windings do not need to be of the same ratio turns, and the rotor can be one of the polyphase types, or a wound rotor may be used.

Theoretically, to attain the motor's highest efficiency, it should use a capacitor of large capacity when the motor is started, and the capacity should be lowered in value as the motor gains in speed. In this manner, the motor would run the same as a two-

phase motor, providing the capacitor was reduced to the exact proper value required to each value of speed and load. In this hook-up, the capacitor acts as a phase changer, which actually changes a single-phase current to a two-phase current.

It is not practical to use a variable capacitor to get these results, but a satisfactory condition may be obtained by the use of a fixed value capacitor, and the installation of a proper switch, or relay, to disconnect the capacitor after the motor has reached its rated speed. The proper capacity may be determined by trying various capacities until one is found that will start the motor within three seconds.

Here again is another use for the Capacitor test box which was described in the September issue of this journal. The test box should be connected to the motor in series with the switch and starting winding. Turning the dial to each capacitor value until one is found which will start the motor and throw off the starting winding within three seconds, accomplishes the same thing as trying several different capacitors.

The capacitor motor is far superior to the two-phase motor in starting performance, because in the two windings, one current leads while the other lags, and the total starting current is much less than that of the two-phase motor of like horsepower, and with the proper value of capacity in the capacitor, the power factor of the motor will be nearly 100 percent.

The capacitor motor using less current will build up more torque than the two-phase motor, and the torque per ampere is double that of the two-phase motor. For this reason, the capacitor-type motor is best adapted for electric refrigeration.

Selecting the Current Voltage Rating

The vector sum of the line voltage and the voltage across the starting winding is the

* Chemist—Economy Condenser Corp., Chicago, Illinois.

actual voltage applied to the capacitor. If the turn ratio of running-winding to starting-winding is one to one, then the voltage across the capacitor will be a little less than one and one-half of the line voltage. Should there be any turn ratio other than one to

one, the voltage across the capacitor would be changed in proportion.

Therefore, it is important to consider this factor for a given motor, to select a capacitor that will have correct voltage rating and proper capacity.

Oil Separators

By F. B. RILEY*

JOBBERs of refrigeration parts and supplies have occasionally commented that they "have no call" for oil separating devices and, therefore, do not stock them.

The function of a jobber is primarily to supply those articles, or materials, for which a demand has been created. This demand may be created in two different ways: First, by the use of a device by compressor manufacturers as a standard part of their assembly; and, second, by extensive advertising by the device manufacturer to build up in the minds of users a demand that the article be incorporated in the original compressor assembly at the factory, or be installed in a unit already in service. The first plan seems, for the moment, the most practical for quick results.

This, briefly, is the present status of the oil separator business, notwithstanding the fact that oil separators have been universal-ly used on practically all ammonia machines for more than fifty years.

The Service Engineers know, of course, that there is such a device as an oil separator but may have had little contact with the operation, or performance, of this highly efficient contrivance when installed as a part of the refrigerating assembly. This is undoubtedly due to the fact that low pressure refrigerants were first used in domestic or household units where there was a gravity return of oil to the crankcase; or, in the case of flooded systems, time and money was lavished in devising means to get the oil back to the compressor from the evaporator. How much better it is to keep the oil entirely out of the low side of the system where it has never performed any useful purpose!

With the advent of the small commercial installations, and including the air conditioning units, many engineers argued that the oil which passes to the evaporator would return readily to the compressor, regardless of the fact that oil and refrigerants have widely varying boiling points and that oil tends to cling to an oily surface, especially to a cold surface, just as moisture of the air clings to a pitcher of ice water.

Some oil does return with the suction gas, but slight must not be lost of the fact that oil continues to gather on the inner surface of the evaporator coils and builds up, or gathers in spots or traps, and not only may cause pressure drops but this insulating film of oil retards the heat flow very materially through the evaporator walls. With a high velocity in the suction gas, the return of oil is unquestionably better than is those systems where the velocity is considerably reduced. Flooded systems with either methyl chloride, or Freon, and low temperature installations are particularly difficult in the matter of oil return, but by no means are they the only offenders. Every type of commercial installation, regardless of the type—flooded, dry gas, multiple evaporator or otherwise—will greatly benefit by keeping the lubricant in the crankcase where it serves its only useful purpose.

Oil in solution with methyl chloride and Freon presents difficulties in separation not experienced to as great an extent with sulphur dioxide or ammonia.

Freon is more difficult than methyl and requires a separator with larger volumetric capacity if the oil is to be entirely taken out and returned to the crankcase. Extensive research as to percentage of Freon that can be passed along to the evaporator without rapidly diminishing heat transfers through

* Riley Engineering Corp., Detroit, Mich.

the evaporator walls indicates that as little as 4 percent of oil with Freon causes a very marked loss in the evaporator and, for the sake of efficiency, should not be tolerated.

The question of waxes in lubricants is receiving a great deal of attention at the moment. Some lubricants contain a comparatively low percentage of wax and, while the waxes seldom separate out except at the lower ranges of temperature, the trouble has been very real with many installations as the wax clogs the orifice of expansion valves, or of capillary tubes and, in many cases, the expansion valves have been blamed for troubles not of their own making.

An efficient oil separator will separate out all of the oil from the refrigerants and with it the wax as well as core sand, dehydrants, metal particles and any other foreign matter that has found its way into the system to hamper the operation of the assembly as a whole. The waxes and the other foreign matter will be trapped in the separator shell and remain there out of harm's way. The service performed by an efficient automatic oil separator can not be measured by the small cost of the device but by the economies and greater efficiency due to multiple duties which the separator performs in the system.

Details of Oil Separator Design

For the past several decades, during which time oil separators have been used in thousands of installations, there have been many designs of separating devices brought out and, naturally, some were more efficient than others. The first designs merely consisted of a certain length of pipe with closed ends and an inlet and outlet for discharge gas from the compressor, a baffle or plate opposite the inlet connection and a hand operated blow-off valve at the lower end of the shell to drain off the oil which might have collected during the operating cycle of the system.

Later on a series of baffles were used to give more oily surfaces for the incoming gas to impinge against and these separators did prove more effective in removing oil from the gas. As automatically operated machines came into general use, a float mechanism was incorporated in the shell so that the entrapped oil might be returned automatically to the crankcase, the high pressure in the separator forcing the oil out through the needle valve to the lower pressure in the crankcase. Little thought was given to other

problems of oil separation; viz., that there must be a time element, or lag, a slowing down of gas velocity through the separator, or the nebulous mixture of oil and refrigerant would pass too quickly through the separator and some of the oil would not drop out but carry on through to the condenser, liquid receiver and evaporators.

There is a definite relation between compressor capacity and volumetric capacity of the separator, if perfect separation is to take place. The separating means, whether baffles or otherwise, must have adequate surfaces to prevent any gas from passing through without impinging on an oily surface. These facts are fundamental and must not be disregarded if high efficiency is to be attained. This is demonstrated by the fact that separators are now offered to the industry that give practically 100 percent separation. As an example of all the oil which passes from compressor to the separator, all but .002 of one percent of this oil is immediately trapped and returned to the compressor crankcase. This is practically perfect separation. Compared with the volume of refrigerant passing through the separator, this minute percentage can hardly be called a trace.

A separator shell may, in relation to the compressor capacity, be so large that condensation of the refrigerant may take place and, with unexpanded refrigerant being returned to the crankcase, there will be a loss of capacity in the installation as back pressure will be increased by the amount of this unexpanded condensation. A separator that is too small will cause the nebulous mixture of oil and refrigerant to pass through into the condenser without allowing time for the oil to separate out properly. Make no mistake about this relation between compressor capacity and oil separator capacity if perfect results are to be obtained.

Oil Separators in Commercial Installations

Some may contend that, because a package unit may use a 1/6 hp. to a 3/4 hp. compressor, an oil separator is unnecessary or that the unit can not stand the small additional cost of an efficient oil separator. Nothing could be further from actual facts. There are literally hundreds of thousands of ice cream cabinets, bottle and beverage coolers, unit air conditioning cabinets, etc., that would operate more efficiently with less operating time and with greatly decreased service troubles if equipped with efficient oil

separators. This is to name only a few of the package installations. Every commercial installation, of whatever kind, would benefit greatly because:

1. The boiling point of the refrigerant will remain at its true boiling point when undiluted by oil.
2. The rapidity of heat transfers is increased very markedly in oil-free evaporators and frequently so from 15 percent to 20 percent.
3. The oil level in crankcase will be constant at all times, eliminating scored cylinders, cranks or wrist pins.
4. The suction and discharge valves and pistons operate better when supplied with proper lubrication.
5. All dirt, scale, core sand and wax are positively removed by an efficient separator.
6. Low temperature installations easily reach from four to seven degrees lower temperature without increased operating time.
7. Flooded Freon and methyl evaporators are seriously handicapped without the help of an efficient separator.
8. Expansion valves will operate more efficiently and with better regulation when kept free from oil, dirt and corrosion.
9. The cost of an efficient separator in any commercial installation is negligible when compared with the benefits above mentioned.

Practical on Any Size Unit

A question frequently asked: Will an oil separator be practical or economical on a package unit of 1/6 to 1/2 hp.? This can only be answered in the affirmative. Small units are never as efficient as the larger compressors and they need all the help that can be given. The price of an efficient automatic separator when put on the unit as a factory installation is so low that there can be no reason for ever omitting this highly efficient device.

It is surprising to realize how much dirt and foreign matter will be found in an oil separator after it has been in service for even a short time. This accumulation in the separator shell means that expansion valve troubles have been eliminated in addition to the fact that with the refrigerants evaporating at their true boiling point in an oil free evaporator, the decrease in operating time with a marked increase in all around efficiency is

clearly noticeable. And, as Dr. Coue would say, "Every day in every way the system is getting better and better."

Like many other devices, oil separators may be placed on the market by organizations which have little knowledge of the exacting requirements of these separating devices and harm may be done to the rapidly increasing use if these separators give faulty or only partial oil separation. It is safe to buy separators which have been through the laboratories and field tests of the compressor unit manufacturers and which are recommended by them for use in the field with their compressor installations. A nationally known manufacturer does not ordinarily recommend any device which has not demonstrated its superiority in performance, quality of workmanship, materials and design.



I. Heuston,
New South Wales, Australia

I have received all books sent by you, and I find THE REFRIGERATION SERVICE ENGINEER a great help to me, and I would like to mention that it is far above anything obtainable here. Wishing it prosperity.

W. G. Barber,
Maryland

I firmly believe that this magazine is the best authority any serviceman could find. I read each issue from cover to cover, and I should be kicked in the pants for not subscribing to this magazine sooner.



Prizes to be Awarded for Article on best



Service "Kink" or Tool

The Refrigeration Service Engineer is sponsoring this contest in the interests of promoting shorter and better service methods. All those actively engaged in the Service of Electric Refrigeration are invited to participate.

OCCASIONALLY in past issues of THE REFRIGERATION SERVICE ENGINEER articles have appeared describing the use and construction of tools or equipment which can be made in the average shop and used in the service field. Other articles have described short-cut methods in service operations and useful service "kinks."

Examples of these articles have appeared in THE REFRIGERATION SERVICE ENGINEER, under the titles and dates following:

"Cotter Pin Extractor and Speed Reamer"—page 29, July, 1938

"Building an On and Off Recorder"—page 13, June, 1938

"Better Rotor Lubrication"—page 32, July, 1937

Because it is our belief that there are many such tools and kinks in use by the individual readers of this journal, which would be interesting to other readers, we will conduct a contest, beginning November 1, 1938, and ending December 31, 1938, for the best articles submitted on these subjects.

Cash awards for the best stories will be made as follows:

For the best article submitted.....\$25.00

For the second best article..... 10.00

For the next three best articles—
each 5.00

For each additional article acceptable for publication..... 2.00

If you are using a tool or piece of test equipment which you made in your shop and which you feel could be used by others, or if you know of some "service tip" which will save time and trouble, write us a letter, describing it in your own way, with as much detail as possible, so that it will be thoroughly understood. If you can supply clear sketches, or photographs, which can be used as illustrations, send them along, also. They

help to clarify a description more than all the writing you can do.

Rules of the Contest

1. All entries must be postmarked before midnight, December 31, 1938.
2. Judges of the contest will be Mr. Geo. H. Clark, Detroit, Mich., Mr. Paul Jacobsen, Marion, Ind., and Mr. Harry D. Busby, Associate Editor, REFRIGERATION SERVICE ENGINEER. Their decisions will be final.
3. Candidates may enter one or more letters, as they see fit.
4. Employees of Nickerson & Collins Co., or regularly contributing editors to THE REFRIGERATION SERVICE ENGINEER, will not be considered eligible for this contest.
5. Letters will be judged on the usefulness, originality, clarity of description and illustration of the device described. Good English, spelling or composition will not be considered in the contest.
6. All entries become the property of Nickerson & Collins Co., and are not returnable, whether used for publication or not.
7. Full credit will be given the author of each letter published.

L. T. Evans
Michigan

I am a subscriber to your magazine, and have, in many instances, received information in one issue alone, which has been worth to me several times the price of the full year's subscription.

Michael Benz, Jr.
Indiana

The best little book ever published.

Service Difficulties on Thermostatic Expansion Valves

By GEO. H. CLARK*

MANUFACTURERS have done much in the last few years to decrease the amount of service required by thermostatic expansion valves and to lengthen their life. Nevertheless they do require service. The difficulties involved in their use are partly due to faults or weaknesses still present in the valves, partly to incorrect adjustments, and partly to improper application.

The various things which may cause service trouble independent of the application will be discussed here. The proper setting for various applications and other questions with respect to application will be discussed in a later article.

Figure 1 shows a type of thermostatic expansion valve which has been widely used. The operation of the valve has been discussed in an earlier article. In order to study the types of trouble that may develop we may first notice the inlet connection. This consists of a screen connection which the flare nut makes gas-tight to the valve body by means of the copper gasket "O." Occasionally a wire from the screen has been known to lay across this gasket or a fine piece of metal may lay on it so that it is difficult to draw the screen connection tight enough to make it gas-tight. In other cases the connection may be drawn tight but when it is loosened and retightened the mark left by the wire or metallic chip may cause the gasket to leak. This is possibility number one.

Second, the screen may become plugged. This of course is no fault of the valve but rather of the system. Nevertheless the valve is the item which has to be serviced. The result of a plugged screen is usually a starved coil with the suction pressure pulling down too low.

Third, the cross plug hole provided in the casting to allow the passage from the inlet to the orifice to be drilled is plugged with a screw and then soldered. If the manufacturer does not do a good soldering job this point offers an opportunity for leaks. This also applies to the other plug in the

valve body as well as to the valve body itself. This matter of leaks, of course, is something that would normally be caught in inspection and should not occur in new valves. Where solders making use of lead as one constituent are used there may be a solder breakdown at the solder plug points occurring in from three months to several years depending upon conditions. These solder breakdowns seem to occur especially in meat counters or coolers. The presence of moisture and CO_2 are factors in causing the lead to turn into white lead, giving a white pasty appearance at the joints.

Fourth, metallic chips or lint may cause the orifice to become completely or partly plugged giving the same result as a plugged screen.

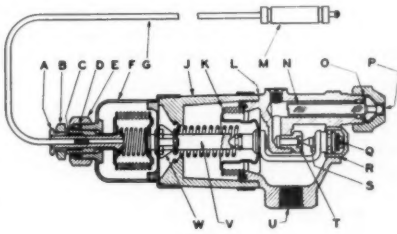


FIG. 1

Fifth, moisture in the refrigerant may cause ice to form at the throttling point. This almost never happens with sulphur dioxide. If it does it is an indication that the refrigerant is so wet it should be removed, the system dried out thoroughly and a new charge of dry refrigerant put in. This freeze up trouble occurs readily with methyl chloride and still more easily with Freon-12. The use of a good drier is recommended in these cases. A good many driers that have been used have been quite ineffective. At the present time there are some very good ones available. A freeze-up may occur after a drier is installed in the liquid line if the drier is not in good condition. The effect of a freeze-up is to plug the valve and cause the suction pressure to pull down very low with little or no refrigeration.

* Chairman of National Educational Board, R.S.E.S.

Sixth, the valve may leak when it should be closed tight due to erosion or corrosion of the needle or seat. Dirt or chips may lodge between the needle and seat holding the valve open when it should be closed.

Seventh, the valve action may become sluggish or cease altogether due to wax formation, varnish formation, and some indications point to a soap formation in the valve body. A study of this type of difficulty is comparatively recent but these formations undoubtedly have been responsible for a considerable amount of service trouble blamed on moisture or unaccounted for. This type of trouble may cause a service man to remove a troublesome valve and send it back to the manufacturer who in testing it may find nothing wrong due to the fact that the wax formation especially may be removed before it is tested. Methyl chloride and Freon-12 definitely have this trouble in systems involving their use. So far there have been no indications of the formations in sulphur dioxide systems. It is quite probable that the use of alcohol to prevent freeze-ups is partly responsible for some of the difficulties of this nature as well as the quality of the oil used, and possibly the introduction of some soldering acids into the systems during manufacture.

Bellows Leaks

Eighth, either the valve body bellows may leak which would cause refrigerant to leak out of the system unless the power element extension shell is hermetically-sealed, or the power element bellows may leak in which case the power element would lose its charge causing the valve to remain closed. Leaks may occur in other parts of the power element due to damage in use which will give the same result.

Ninth, unless the power element extension is hermetically tight, a breathing action may cause moisture to condense in the shell, which eventually would freeze up at the bellows so that it could not move freely, causing the valve to lock in whatever position it was in, which in some cases is the open position causing too much refrigerant to flow, and in others cases is the closed position, causing the coil to be starved as by a freeze-up at the valve seat.

The single-diaphragm type of valve is not subject to the trouble indicated above. A leak through the diaphragm of that type of valve will make the valve close off, giving the same results as a plugged valve.

Tenth, the power element bellows may be cooled down to a lower temperature than the thermostatic bulb, in which case the bulb loses control of the valve with a gradual slowing down of refrigerant flow resulting. This type of trouble does not occur with the liquid charged single-diaphragm valves.

Eleventh, the valve may chatter due to the unrestricted movement of the needle assembly. This is taken care of in the valve shown by means of the friction device "W" which puts a damper on the free valve movement. Excess friction, of course, will cause an action similar to that of a valve with gummy deposits around the needle guide.

From this study it will be readily seen that there are a number of things which can occur to cause trouble at the thermostatic expansion valve.

The thermostatic expansion valve is a critical part of a refrigerating system and it is not to be expected that troubles of various kinds will not concentrate at this point in the system. The refrigerating system has two principal working elements, the compressor and the expansion valve. The compressor raises the refrigerant pressure or compresses it so that heat may be removed from it at ordinary temperatures, while the valve reduces the refrigerant pressure so that heat may be added to the refrigerant at low temperatures. To a large extent the rest of the refrigerating system consists of tubes which have no operating parts which may get out of order.

How Operation May Be Affected

The operation of the thermostatic expansion valve may be affected by a number of different things. Whereas most valves will take care of a wide variation in capacity of the condensing unit, there is a particular setting which will give most ideal results for one evaporator condition and one compressor capacity. A change of compressor capacity will affect the operation of a valve to some extent. A twelfth service complaint may be described as surging. In this case the valve, having a greater capacity than needed, lets the refrigerant through too fast and then as the thermostatic bulb feels the result of this, the valve is closed. The result is a surge in suction pressure and in a good many cases a very wide variation in coil temperatures. In some cases the temperature of the air leaving an air conditioning coil may vary over ten degrees within three or four minutes due to the surging condition.

This matter is tied up with valve application and coil design so will be discussed in more detail at a later date but the complaint still comes in as a matter of service required. The superheat adjustment is also tied up with this complaint. To a large extent valves are set to maintain a refrigerant temperature in the coil ten degrees lower than the temperature of the thermostatic bulb or are set for ten degrees of superheat nominally. Whereas this setting probably suits more conditions better than most others there are cases where twenty degrees is more practical and others where superheats as low as two degrees may be required. In some instances negative superheats may be re-

quired. The maladjustment of thermostatic expansion valve may also be classed as a service complaint.

Undoubtedly the best means of correcting difficulties that arise in the use of thermostatic valves lies in a thorough understanding of the operation of the valve being used.

Of the service complaints mentioned the third, fourth, sixth, eighth, ninth and eleventh require the replacement of the valves. The other complaints can be remedied without replacing the valves.

In cases five and seven the valve should be removed, washed out with alcohol, dried out and reinstalled.

The Question Box

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment as well as oil burners to "The Question Box."

MORE COMMENTS ON QUESTION 271

COMMENTS on Question 271 of the August issue of the REFRIGERATION SERVICE ENGINEER are well clarified by Mr. Willis Stafford, Aurora, Ill.

This heater element is a 17-watt element, connected across the switch contacts, such as to give a circuit through the element only when the machine is idle. This was added for the purpose of reducing the ability of the crankcase oil to absorb F-12 refrigerant, the belief being that this had some tendency to carry off the oil, thereby affecting the life of the seal.

Yours truly,

J. Lawrence Hall, Nashua, N. H.

THE Question Box: In response to your request for further information on the heating element used on the 1981 Frigidaire models using F-12, I have installed many of them and the instructions were to drill the fuse receptacle to allow the wires to be put through and connect the two wires to the terminals of the switch. This would place the heating element in series with the motor on the off-cycle of the unit and keep the oil in the crankcase warm to prevent excessive

absorption of F-12 by the oil and consequent scrubbing at the start of the on-cycle. This prevented many dry crankcases and cut seals. It was generally put on very quietly because of the customer's suspicion of any additional current using device, but seemed to do a pretty good job on an installation that had this trouble. I have often wished I had something of that nature to use on some of these outdoor compressor installations that are troubled that way in winter. A thermostat switch will control cabinet temperatures, but the rods, pins and seal take a lot of punishment in cold weather when the crankcase is colder than the coils and raw refrigerant flushes the oil out of the crankcase.

CHANGING RECEIVER VALVES

QUESTION 279. I would like some information in regard to a Carrier-Brunswick compression unit, Model 53-20 W.F., Serial No. 18805.

The compressor valve stem has been broken off so the valve cannot be closed between the receiver and compressor. I would like to know the fastest way to discharge the receiver without losing the refrigerant, so I can install a new valve.

I am enclosing a diagram of the head of the receiver, in which No. 1 appears to be a 1/4-inch valve stem; No. 2 is a protrusion or boss, about one inch in diameter, extending out from the head about 1 1/2 inches, the outside diameter being threaded; Nos. 3 and 3 apparently are hex head plugs. What is the purpose of these?

Is the water, or refrigerant, circulated through the coil?

In the April, 1936 issue of THE REFRIGERATION SERVICE ENGINEER, there is a chart for determining the proper charge of air-cooled units. Is there a similar method of determining the proper charge for water-cooled units?

ANSWER: I am none too familiar with this model of the Carrier-Brunswick unit, but I believe it is so arranged that you have a service shut-off valve on the head of the compressor, and the gas passes through this to another valve on the shell and tube type condenser. It is this latter valve which, I believe, is broken. I take it for granted that the system is charged with Freon.

The only manner in which this valve can be changed without losing any gas would be by connecting an empty drum sufficiently large to hold the entire charge to the compressor and head service valve. Close the valve all the way in, connect the high pressure cut-out switch in the line going to the drum, and let the machine run until all the gas is pumped over to the drum, and the system entirely evacuated. The drum, of course, would have to be placed in a running bath of cold water.

This procedure would take several hours, dependent on the amount of gas in the system, but if the high pressure cut-out was connected to the line going to the drum, it would be safe to go about other work and leave the machine for several hours.

I have performed this same service operation within approximately one hour by purging gas from the top of the condenser at a fairly rapid rate, until the gas in the receiver was cold enough, and the pressure down to about one or two pounds, so that the valve could be removed and changed while the low pressure gas was still blowing out. The gas, of course, should be purged to the outside, and everything should be in readiness for a quick change as soon as the pressure is reduced sufficiently to make the change safe. The comparatively small amount of gas lost in this method would probably not represent as much cost

as the additional labor and inconvenience in the other method. This method can be used on methyl, Freon and SO₂, but I don't believe it would be safe to attempt with ammonia.

As a precautionary measure, I would suggest keeping your face well back from the valve while changing because of the possibility of sudden surges of gas being released from oil blanket in the receiver, which might cause dirt, oil or vapor gas to blow up in your face. If everything is in readiness before the loosened valve is actually removed, the change should only take a matter of seconds.

Be sure the water is shut off and drained from the coil before purging, since with the reduced temperature of the receiver, this coil may freeze and burst.

In your diagram, No. 1 is probably a liquid level test cock; No. 2 a fusible plug; No. 3 a spare plug for other connections that may be desired.

Water is circulated through the coil, while the shell acts as a condenser and receiver.

I don't know of any chart similar to the one published, which would determine the proper refrigerant charge for water-cooled machines.

CHANGING FROM AMMONIA TO FREON

QUESTION 280. In your most recent publication, we find some mention made of changing ammonia systems to methyl chloride. In each case, it seems as though the user intended replacing the highside with methyl chloride machinery.

We have today a customer who desires to change over a complete ammonia system to methyl chloride, or Freon. Our present system is a Model 1500 Lipman ammonia compressor, refrigerating a brine bath. This brine, in turn, refrigerates a copper fin coil for theater cooling. The present plan is to eliminate the brine bath with its coils, and to connect the fin-type copper coil to our compressor, changing our refrigerant to Freon or methyl chloride.

Please advise if this will be a practical change, what procedure would be necessary to remove all possible traces of ammonia, what oil would be recommended for the compressor, and also, if there is a manufacturer who will make a rotary or siphon-type seal to replace the present stuffing box.

ANSWER: I see no reason why a change from ammonia to methyl chloride in this particular model of the Lipman ammonia

compressor should not be practical.

The only difficulty that may be encountered is that of changing from a stuffing box to a mechanical type of seal. I don't know of anyone who manufactures a seal for this machine as a standard product, but I am informed that the Rotary Seal Co., 809 W. Madison St., Chicago, Ill., has made them on special order. However, it is not possible, I believe, to do this in every case. The space within the stuffing box will sometimes not permit the use of a mechanical seal. I would suggest that you contact them sending them a sketch of this space, giving all the dimensions and data you can, and they will, I am sure, be able to inform you of anything that can be done with it.

In order to change the gas to either methyl chloride or Freon, since you will be confronted with the problem of moisture in this system due to the fact that the coil has had brine circulated through it, I believe the best method of removing all traces of ammonia and cleaning would be to dismantle the compressor and thoroughly clean, and then charge with a sufficient quantity of a 300 viscosity oil. The condenser, receiver, and lowside coils should be flooded first with circulated water to remove the ammonia, and then flooded with alcohol to remove the water. Then, after blowing out as much of the alcohol as possible, a high vacuum should be pulled on the system, and heated as much as possible with a blow torch, or any other means you have, in order to remove the alcohol. Finally, a good drier should be installed in the system. Since there will be a drop in the capacity of this compressor when changing from ammonia to some other gas, I would suggest that Freon be used because it will give the greatest capacity to the machine, of the two gases.

TOP OR BOTTOM FEED TO COILS

QUESTION 281. (1) What are the advantages and disadvantages of connecting a dry expansion coil with a thermostatic expansion valve for (a) bottom feed (b) top feed? Which system gives the greatest efficiency, economy, control, etc. and why?

(2) Kindly describe the method and necessary gear to recalibrate a lowside float valve, as used for sulphur dioxide.

(3) What tests can be applied to an oil to determine its suitability to any particular refrigerant? How is viscosity determined?

ANSWER: In general, the top connection for the expansion valve to the coil is pre-

ferred, since in most cases, it offers the greatest efficiency and economy, and better control.

The advantages of each, which I can think of at present, are as follows, and the disadvantages of one are the advantages of the other:

Top Feed

- (1) Maintains a comparatively dry condition of the coil
- (2) Prevents surges of liquid reaching the feeler bulb and giving false control
- (3) Permits better draining of oil through the coil, and tends to overcome any trapping of oil in the coil
- (4) Gives greater scrubbing action of the gas in the coil
- (5) Permits better distribution of the gas in the coil throughout the cycle
- (6) Due to the drier condition of the coil, it permits a slightly lower operating temperature for a defrosting cycle
- (7) Will operate on smaller quantity of gas in system

Bottom Feed

- (1) Creates a partially flooded condition of coil, which gives a slightly better holdover

For information regarding the recalibration of lowside floats, I will refer you to the R. S. E. S. 1937 Year Book, which I believe will thoroughly answer your question.

For information regarding tests on oils and how viscosity is determined, I will refer you to the article written by George H. Clark, and contained on page 26 of the February, 1936 issue of THE REFRIGERATION SERVICE ENGINEER.

MAJESTIC SERVICE

QUESTION 282. I was working on a Majestic Model 335, Serial No. 1-14619, which would defrost between cycles, and on which I changed the cutting-on temperature of the thermostatic switch.

Could you tell me what was wrong? It is an expansion valve. How much vacuum should be drawn, or pressure in pounds?

When a vacuum is drawn on a rotary compressor, should it stay when the compressor stops, or go back right away?

ANSWER: Several things can cause a thermostat on the Majestic, or any other refrigerator for that matter, to require adjusting.

First of these reasons may be due to the thermostat itself. Parts may become worn,

which would require adjustment of the thermostat to bring it back to its proper temperature, or the power element may be losing its charge. Another reason for this trouble might be due to changing conditions in the cabinet itself, such as deteriorating insulation, leaky door gasket, or perhaps to the particular manner in which the customer uses the refrigerator, whereby the heat load may be increased, requiring a lower temperature of the evaporator in order to maintain the proper box temperature.

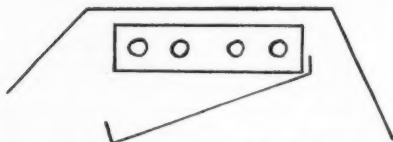
The suction pressure on these machines will vary anywhere from 6 to 10 inches, depending upon the evaporator temperature maintained. The Majestic rotary compressor, like most other rotary compressors, is so constructed that the service port is located between the compressor and the check valve, and it, therefore, follows that as soon as the compressor stops, pressure from the nighside will back up to the check valve, and will, of course, be indicated on your pressure gauge.

ICE FREEZES IN DRAIN PAN

QUESTION 283. I am having some trouble with a double-duty display case in a local meat market. This is a 14-ft. double-duty case, pulled by a $\frac{3}{4}$ -hp. Curtis "methyl" unit. The feed-in goes from the expansion valve through the top coil, then through the bottom coil, each end being separate.

To keep the proper case temperature, the top drip pan freezes up, and then runs over onto the trays. The coils seem to frost up okay, but I'm of the opinion that by opening the thermostatic valve more, the top coil won't get so cold to cool the case, and may remedy this trouble. Am I right?

ANSWER: As I understand your difficulty, it boils down to purely the matter of overcoming the freezing of the drain pan.



Showing Approximate Angle of Drain Pan.

Apparently, from what you say, the temperatures of the case are satisfactory, and the machine and coils operate as they should; that is to say, the coil will frost and defrost during the off-cycle. If this is the case, then I see no reason for making any change

in the control settings. However, I might say in passing that adjusting the expansion valve in such a case would not necessarily make this coil warmer. It would be necessary to adjust the pressure control in order to accomplish any adjustment of temperature, or if it should happen to be a multiple hook-up, then the temperature of this particular coil could be changed by adjusting the expansion valve, but it would have to be closed so that less liquid would reach the coil in order to make it warmer.

I believe, however, that your problem is purely one of proper installation of this drain pan. I would suggest that it be lowered, allowing a greater space between the coil and the pan, and given considerably more slope, so the water would drain more rapidly and so as to increase the circulation of air through the coil.

Fig. 1 will give you an idea of what I mean, and in what direction the drain pan should be sloped.

REMOVAL OF OIL IN AMMONIA EVAPORATOR

QUESTION 284. Would it be advisable to use skimmer holes in the suction line to get rid of the oil in the evaporator of a commercial lowside float flooded system charged with ammonia? Explain.

What is the lowest temperature sulphur dioxide will evaporate at, if you use an absolute pressure of 19.5 lbs. per square inch? Have you a chart to show these temperatures?

ANSWER: Skimmer holes in the suction line of the evaporator using ammonia would be of no value in getting rid of the oil, since the specific gravity of ammonia is so much lighter than oil that the oil always settles in the bottom.

Removal of oil in this type of system is usually done through a purge valve, or drain plug, installed in the bottom of the evaporator, or in some evaporators, the drain plug may be at a higher point, with a tube running to the bottom of the evaporator through which the oil may be drained. There is no other manner, that I am familiar with, in which this can be done.

At an absolute pressure of 19.5 lbs. per square inch, you would have a gauge pressure of 4.8 inches at sea level, or a temperature of 25 degrees. The enclosed pressure-temperature relation chart is one put out by the Republic Electric Co., which I happened to have in my desk, and will, no doubt, serve your needs.

REFRIGERATION SERVICE ENGINEERS' SOCIETY

Official Announcements of the activities of the National Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.



THE OBJECTS OF THE SOCIETY

To further the education and elevation of its members in the art and science of refrigeration engineering; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

ASSOCIATION HEADQUARTERS: 433-435 North Waller Ave., CHICAGO, ILL.

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KANSAS CITY CHAPTER NO. 1, KANSAS CITY, MO.: Meets on 2nd and 4th Tuesdays of month at Commonwealth Hotel. President, T. L. Anderson; Secretary, S. A. Leitner, 3112 Holmes St., Kansas City, Mo.

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Directory of Chapters Continued on Next Page

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- SCRANTON CHAPTER NO. 1, SCRANTON, PA.:** Meets 1st and 3rd Tues. at Jr. Mechanics Hall. President, Wm. Franklin; Secretary, C. G. Hess, 321 N. Everett Ave., Scranton, Pa.
- SPRINGFIELD CHAPTER NO. 1, SPRINGFIELD, ILL.:** Meets 2nd and 4th Wednesdays of month. President, F. W. McVay; Secretary, A. L. Hammond, 319 W. Cook St., Springfield, Ill.
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- TRI-COUNTY CHAPTER NO. 1, ILLINOIS:** Meets 2nd Monday of month in Elgin, Aurora and Joliet, Illinois, respectively. President, Eugene White; Secretary, Willis Stafford, 726 Hinman St., Aurora, Ill.
- TRI-STATE CHAPTER NO. 1, HUNTINGTON, W. VA.:** Meets 1st Monday of month from May to October, and from October to May on the 1st and 3rd Mondays. President, C. A. Brunton; Secretary, A. W. Albertsen, 206 W. 8th Ave., Huntington, W. Va.
- TWIN CITIES CHAPTER NO. 1, MINNEAPOLIS AND ST. PAUL, MINN.:** Meets 2nd Tuesday of month at the Midway Y. M. C. A., at 1977 University Ave., St. Paul. President, A. E. Johansen; Secretary, B. J. DeLange, Como Station, Route 3, St. Paul, Minn.
- VULCAN CHAPTER NO. 1, BIRMINGHAM, ALA.:** President, Sandy Nelson; Secretary, E. D. Gothberg, B. 2, Box 225a, Birmingham, Ala.
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- YOUNGSTOWN CHAPTER NO. 1, YOUNGSTOWN, OHIO:** Meets the 1st and 3rd Monday of month at the Central Y. M. C. A. President, M. Bokesch, Sr.; Secretary, Martin Bokesch, Jr., 2323 Mahoning Ave., Youngstown, Ohio.

On to Buffalo!

to the 5th Annual Convention and Manufacturers' Exposition

Plans All Set—Outstanding Program Arranged— On to Buffalo Is the Service Engineer's By-Word

"ALL READY" is the word from Buffalo as this issue goes to press. The center of activity for the refrigeration service and installation engineers' convention is on the 17th Floor of the Hotel Statler in Buffalo, November 2-3-4.

Convention committees have been hard at work arranging an outstanding educational program and entertainment features, which will make this service engineers' convention an important event. A complete program of educational and entertainment features will be found on another page of this issue.

All interested in the refrigeration industry, whether members or not, are cordially invited to participate in this convention.

Come—learn and see. You will have the opportunity of hearing outstanding authorities of national reputation. This convention will be an inspiration—it will return you to your work enthused with new profitable ideas.



Hotel Rates

The Housing Committee, of Buffalo, promises accommodations to fit every purse. The Hotel Statler is the official convention headquarters, and rates are as follows:

Room for one per day, begins at \$3.00.

Room for two per day, double bed, begins at \$5.00.

Room for two per day, twin beds, begins at \$6.00.

All rooms with private bath, shower, or tub and shower.

Other hotels with rates beginning at \$2.00 and \$2.50 per day per person include the Hotel Buffalo, Hotel Lafayette and Hotel Ford, all within convenient walking distance of the Statler. The Housing Committee will provide accommodations at any rate desired. Economical parking facilities adjacent to all hotels are available.

Entertainment

Entertainment features for both men and ladies have been carefully planned by the Entertainment Committee.

On Wednesday afternoon, an optional trip has been planned for members, guests

and ladies who desire to visit Niagara Falls. Buses will leave the Hotel Statler promptly at four o'clock, and an opportunity will be provided to see all of the points of interest during the afternoon and to see the Falls illuminated in the evening. A stop-over for dinner will be made. The cost of this trip will be \$1.00 per person, and arrangements are being made for a dinner at \$1.00 per person. The buses will return to the hotel in time for the entertainment planned for the evening, starting at 9 p.m. Arrangements for this trip can be made at the Registration Desk.

The entertainment planned for Wednesday evening will consist of an Amateur Night Show for all the ladies, members and guests.

Thursday night will be the Annual Banquet and entertainment.

Friday evening will be a Farewell Party and variety entertainment.

The Ladies' Committee has planned events for each day for the ladies. On Wednesday morning at 10 a.m., a program sponsored by the Buffalo-Niagara Hudson Home Economic Department has been arranged. This program is scheduled so that sufficient

Come to Buffalo

ON behalf of the officers and members of the Refrigeration Service Engineers Society, I extend a cordial invitation to every reader of the REFRIGERATION SERVICE ENGINEER to attend the 5th Annual Convention and Manufacturers' Exhibit in Buffalo, November 2, 3 and 4. Every refrigeration service and installation engineer will be interested in this educational and entertaining convention.

W. HALL MOSS, *National President*

time will be provided to take advantage of the trip to Niagara Falls.

On Thursday morning, a get-together meeting for the ladies will be arranged. Thursday afternoon all of the ladies are invited to witness the interesting film, "Imprisoned Freshness"—an educational film on frozen foods arranged by the Frosted Foods Sales Corp.

Friday morning, a tour through one of Buffalo's representative department stores, to be followed by a luncheon at the store, is scheduled.

All of the evening events are arranged for the ladies, too!

Educational Features

Many interesting educational features have been planned for this convention. On Wednesday afternoon, a tube bending contest to determine the champion tube bender of the National Society will be held. A complete announcement of this contest will be found on another page of this issue.

On Thursday afternoon a movie film will be shown. The film "Imprisoned Freshness"—depicting the preparation and distribution

of frozen foods will be shown. On Friday morning, "Selling America"—a sound film with an important merchandising message will be shown.

Registration Fee

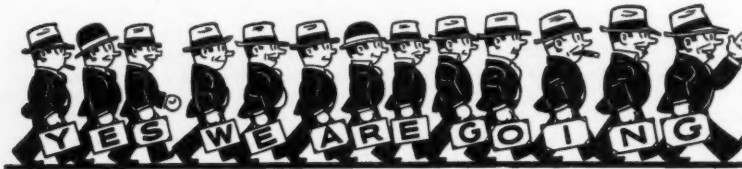
All of the entertainment features, with the exception of the trip to Niagara Falls, will be included in the nominal registration fee of \$3.00 for members, which provides the entertainment and banquet for all the events during the convention held in the Hotel Statler.

This service engineer's convention, planned for the education and entertainment of the refrigeration service and installation engineer, will be the outstanding event of the year. Make arrangements now to be present in Buffalo, November 2-4.

\$ \$ \$

ROOM RESERVATIONS

IT is advisable to make room reservations in advance to secure desired accommodations. The official convention headquarters will be the Hotel Statler. In writing be sure to indicate for R.S.E.S. Convention.



☆☆

An ALL STAR Program for an ALL STAR Convention

☆☆

★ A program replete with practical information for the refrigeration installation and service engineer is the highlight of the 5th Annual R.S.E.S. Convention. Carefully planned to bring to every service engineer a practical intensive discussion of current trends in the business, this all star program will bring outstanding leaders in their respective fields.

Dr. Willis Carrier to Address Convention

★ One of the headliners on the program will be Dr. Willis Carrier, Chairman of the Board of Carrier Corp., Syracuse, N. Y.

★ Dr. Carrier is known throughout the world for his contributions in connection with air conditioning, and particularly for the presentation of his Rational Psychrometric Formulae. He has been honored with many degrees and has been the principal speaker on leading engineering programs.

★ The complete program follows:



Dr. Willis H. Carrier, chairman of the board of the Carrier Corporation, Newark, N. J., reads a 100-page book filled completely with messages congratulating him on the 25th Anniversary in 1937 of the presentation of his Rational Psychrometric Formulae, foundation of the air conditioning science. Greetings and honors were received from all over the world.

Announcing

FEDDERS

Model HCP-38

HIGH CAPACITY

**CONSTANT
PRESSURE
VALVE**





For use on large refrigeration and air conditioning installations to prevent suction pressure in coil from falling below desired point.

It makes it possible to accurately maintain temperature of different evaporators when connected in multiple to one compressor. Easily adjusted . . . it accurately controls pressure within range of a few ounces.

Send for Bulletin 389

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G. A. BURNS, Toronto, Can.
Second Vice-president

Tuesday, November 1st—Registration
Wednesday Morning, November 2nd

- 8:00 a.m. to 10:00 a.m.—Registration.
10:00 a.m.—Convention Call to Order—D. E. Schuster, President of Niagara Frontier Chapter.
10:15 a.m.—Invocation.
10:30 a.m.—Buffalo Welcomes You.
Address by Dr. W. Carrier.
Introduction of National Officers.
Address of National President—W. Hall Moss, Memphis, Tenn.
10:45 a.m.—Secretary's Report—H. T. McDermott, Chicago, Ill.
Treasurer's Report—S. A. Leitner, Kansas City, Mo.
11:00 a.m.—Committee Reports: Educational—George H. Clark, Detroit, Mich.
Unit Labor Survey—P. B. Reed, Evansville, Ind.

- Membership—E. A. Pleeskott, St. Louis, Mo.
Dehydration of Refrigeration Equipment and Systems—Warren W. Farr, Cleveland, Ohio.
11:45 a.m.—Appointment of Convention Committees.
Announcements.
Adjournment.

Wednesday Afternoon

- 2:30 p.m.—Tube Bending Contest.
4-4:30 p.m.—Trip to Niagara Falls. See the Falls in daylight and illuminated at night. Reduced rates to members of R.S.E.S. Trip optional.

Wednesday Evening

- 9:00 p.m.—Amateur Night. Those attending the Niagara Falls trip will be back in time for amateur night.



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Member, Board of Directors



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Beaver Dam, Wis.
Member, Board of Directors



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H. T. McDERMOTT, Chicago
National Secretary



R. L. DARBY, Longbeach, Calif.
Sergeant-at-Arms

Thursday, November 3rd

- 9:45 a.m.—Meeting Call to Order.
9:45 a.m.—Question Box—George H. Clark,
Detroit, Mich.
10:00 a.m.—A Generation in Refrigeration
Service—Mr. A. Hulbert.
10:15 a.m.—The Control of Beer Quality—C.
D. McLaughlin, Dayton, Ohio.
10:30 a.m.—Sound Film—"They Know How"
General Electric Co.
11:30 a.m.—Dryers and Drying Agents—V.
E. Hall, Binghamton, N. Y.
11:45 a.m.—Controls and Their Servicing—G.
E. Graff, Columbus, Ohio.
12:00 m.—Report of Nominating Committee.
Election of Officers.
Adjournment.

Thursday Afternoon

- 2:30 p.m.—Sound film—"Imprisoned Fresh-
ness,"—Frosted Foods Sales Corp.

Thursday Evening

- 7:00 p.m.—Annual Banquet and Entertain-
ment.

Friday Morning, November 4th

- 10:00 a.m.—Meeting Call to Order.
10:00 a.m.—Refrigeration Service Tips—A.
Walter, Buffalo, N. Y.
10:15 a.m.—Servicing Hermetics—S. R.
Thompson, Chicago, Ill.
10:30 a.m.—Sound Film—"Selling America"
—A Merchandising Message.
11:30 a.m.—Servicing Ice Cream Cabinets—
E. J. Newcomer, Chicago, Ill.
11:45 a.m.—The Pressure Drop Through
Pipes—George H. Clark, Detroit, Mich.;
E. Gygas, St. Louis, Mo.; Karl Willson,
Marinette, Wis.

Friday Evening

- 7:00 p.m.—Farewell Party and Variety En-
tertainment.



W. L. DRAKE, Indianapolis
Member, Board of Directors



C. P. EICH, Youngstown, Ohio
Member, Board of Directors



GEORGE H. CLARK, Chairman
National Educational and
Examining Board

Where They Will Be Found



THE exhibitors, who are participating in the manufacturers' display, will provide an interesting exhibit of various refrigeration equipment. The exhibit will occupy a prominent place adjacent to the meeting hall. Here will be found a diversified and representative display of prominent manufacturers, who are arranging educational exhibits to provide first-hand information to the service engineer users of their equipment.

The participation of these manufacturers accomplishes a two-fold purpose: First, in reaching the potential users of their products; secondly, by the purchase of exhibit space, contributing to the educational fund of the National Society in carrying out its educational program for the coming year. Following is a list of exhibitors who will be represented, and where they will be found:

BOOTH NO.	EXHIBITOR
1	Detroit Lubricator Co.
2	Universal Cooler Co.
3	Dayton Rubber Mfg. Co.
4	The Texas Co.
5	Rotary Seal Co.
6	Aluminum Co. of America.
7	Melchior, Armstrong, Dessau Co.
8	Peerless of America, Inc.
10	Kold-Hold Mfg. Co.
11	Root, Neal & Co.
12	Cordley & Hayes.
13	Fedders Mfg. Co.
14	Copeland Refrigeration Corp.
15	Ranco, Inc.
16	Imperial Brass Mfg. Co.
17	Bush Mfg. Co.
18	R. & H. Chemicals Dept.
19	Kerotest Mfg. Co.
20	Penn Electric Switch Co.

- 21 Virginia Smelting Co.
- 23 Automatic Products Co.
- 24 Mills Novelty Co.
- 25 South Bend Lathe Works.
- 26 Ansul Chemical Co.
- 27 American Radiator Co.
- 28 Mueller Brass Co.
- 29-30 Minneapolis - Honeywell Regulator Co.

§ § §

"ON TO BUFFALO" IS WIDELY PUBLICIZED
MANY manufacturers and jobbers have cooperated in the publicity promotion for the Buffalo Convention.

Nearly 1,000 refrigeration servicemen in the Montreal area have received a pamphlet and invitation to attend the convention through the cooperation of Modern Household Appliances, Ltd., manufacturers' agents for a number of standard makes of refrigeration parts, and Airco Refrigeration Parts, Reg'd.

Airco Refrigeration Parts, Reg'd. is a local parts jobbing house that has been interested in the success of Mount Royal Chapter, in Montreal. Modern Household Appliances, Ltd., as manufacturers' agents in Canada, provides a source of supply of standard refrigeration equipment and supplies for Canadian distribution. Through the cooperation of these various firms, a representa-



CITY OF BUFFALO
 OFFICE OF THE MAYOR

September 23, 1938

Refrigeration Service Engineers Society

Gentlemen:

As Mayor of the City of Buffalo, I take great pleasure in extending to you an advance word of greeting and welcome with the earnest hope that you will make every possible effort to honor Buffalo with your presence at the forthcoming annual convention of the Refrigeration Service Engineers Society.

I am sure, from information that I have received from your local committee, that this, your convention, will be an exceptionally pleasant and profitable one for all members who attend.

I am certain that you will like the City of Buffalo and its environs. We want you to know us! We desire to know you, and I am thoroughly confident that at the completion of your convention you will depart from this city happy that you came.

Very truly yours,

Thomas L. Holling
 Mayor

TJH:W

tive attendance from Montreal is expected at the convention.



THE HARD-WORKING MEMBERS OF THE CONVENTION COMMITTEE.

They are down to their shirt sleeves now, and going strong. Unfortunately, all the members of the Committee were not present when this view was taken, but those we are able to identify in the above are: Back Row, left to right—C. Rittling, Wm. Powell, G. O'Hara, H. T. McDermott, D. B. Schuster. Front Row—Geo. E. Wilson, R. B. Davis, F. Cameron.

BUFFALO WELCOMES YOU



D. B. SCHUSTER

Queen City of the Lakes is internationally famous.

Without the usual fanfare and ballyhoo our convention committees, under the able guidance of the general chairman, Mr. Geo. Wilson, have formulated a program which I am positive will meet with the approval of one and all and serve as a criterion for future conventions.

Realizing this convention is a business meeting of business men, our educational

As president of Niagara Frontier Chapter it is my privilege to extend to all the members of the R. S. E. S., their ladies and guests, an invitation to come to Buffalo and partake of the hospitality for which the

program, through the co-operation of those men who are the leaders in their fields, is without parallel. The exhibits likewise have been solicited from that group of manufacturers who, through their representatives and engineering departments, have always been ready and willing to offer the Service Engineer every conceivable opportunity to make our motto, "We DO IT RIGHT" a proven fact.

The entertainment program is an innovation, inasmuch as it has been planned and arranged so that it will not conflict with the business meetings, educational features, the program by the Ladies Auxiliary or time allotted for visiting and observing the exhibits.

Buffalo is a friendly city. It is a home city. It is a city where people call each other by their first names. Therefore, in welcoming you to Buffalo, the Queen City of the Lakes, we do so from the bottom of our hearts. The latch string is out and "Welcome" is on the doormat and during your sojourn in our city we want you to thoroughly enjoy yourselves.

And so, gentlemen—and your ladies,—I give you Buffalo.

Conventionally yours,

*Don Schuster, President
Niagara Frontier Chapter.*

NEW YORK STATE ASSOCIATION TO BE FORMED AT BUFFALO CONVENTION

ARRANGEMENTS will be made for the representatives of the various chapters located in New York State to make preliminary plans for the formation of a New York State Association, to include all chapters in the State.

Mr. Harold Persett, president of Syracuse Chapter, will arrange for a meeting at the convention.

§ § §

PEORIA, ILLINOIS, CHAPTER FORMED

AFTER several meetings of prospective members, Illinois Valley Chapter, of Peoria, Illinois, has been formed, and will receive their charter October 14.

Temporary officers, selected for the chapter, include:

F. C. Volkmar, *President*; Scott Goble, *1st Vice-President*; H. A. Webb, *2nd Vice-President*; A. D. McGill *Secretary*; Ralph E. Brown, *Treasurer*; Wayne Davidson, *Chairman, Educational Committee*.

NEW CHAPTER BEING FORMED IN ATLANTA, GA.

AS we go to press we are informed of a new chapter being formed in Atlanta, Ga., to be known as Atlanta Chapter No. 1. The efforts of Mr. Thomas L. Carnell have brought about an organization meeting and it is reported that application for a charter is now being made.

A complete report of the meeting will be contained in the next issue of this journal.

§ § §

IMPERIAL BRASS WILL CONDUCT CONTEST AT ANNUAL CONVENTION

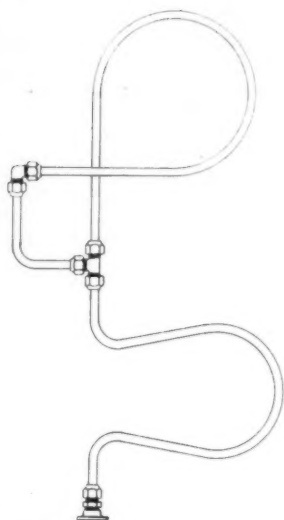
ANNOUNCEMENT was recently made of a soft tube erecting contest to be held at the 5th Annual Convention of the Refrigeration Service Engineers Society in Buffalo, N. Y., November 2-3-4, with prizes to be awarded the winning contestants.

The contest is sponsored by the Imperial Brass Mfg. Co., and every chapter is urged to enter one representative, regardless of whether he is an expert or not.

Contests of this type have been held at several chapter meetings with very success-

ful results. Not only have they attracted increased attendance, but they have proved very educational. This contest is intended to promote further activity of this nature in other chapters.

Contestants will be asked to bend and erect soft copper tubing and flare fittings into the design specified in a blueprint to be supplied at the contest. A design used in other meetings is shown here.



Type of Construction used in other tube bending Contests

Contest Rules

Every contestant must register with the judges before starting.

Only one contestant from each R.S.E.S. chapter will be permitted to enter.

Contestants will bend and erect copper tubing and flare fittings into the design specified in the blueprint which will be supplied at the contest.

Each contestant will furnish his own bending, flaring and cutting tools, wrenches, and rule for measuring. (Contestants may bring whatever tools they feel they need. However, no special bending jigs will be allowed and tools must be of a standard nature.)

Soft copper tubing and fittings will be provided by the sponsors of the contest. No pipe joint compound need be used on any joint.

All discussions and awards will be decided by three judges appointed by the So-

ciety. Their decision will be final in all matters affecting the contest.

The winners shall be determined on the following basis:

The first three who complete the problem and lay it on the finish table shall have their elapsed time recorded. Elapsed time shall not alone determine the winner, however. The following conditions will be considered:

A tolerance of plus or minus one inch will be allowed on all dimensions shown on the problem sheet. Should any dimension exceed this tolerance the entry is automatically disqualified.

For any of the following conditions found on the completed problem, the contestant shall have added to his actual elapsed time the amount set forth:

Each poor flare on tube joint.....	15 seconds
Loose flare nut.....	15 seconds
Marred brass nut or brass fitting (such as the marks made by pipe wrench), per fitting marred.....	15 seconds
Kinked or flattened tube.....	60 seconds
General form of problem not followed although dimensioned points are within tolerance	60 seconds

When the above penalty times have been added to the contestant's actual elapsed time, the contestant having the least total time, including assessed penalties, shall be declared the winner.

ILLINOIS STATE ASSOCIATION HOLDS ITS FIRST ANNUAL MEETING

THE First Annual Convention of the Illinois State Association of the Refrigeration Service Engineers Society can now be relegated to the annals of history, but in doing so, it must be classified as one of the very successful meetings of the year.

Occupying the two days of October 1 and 2, the many attractions of the affair were enjoyed by a registration of approximately 150 persons from all parts of the State of Illinois, and a few from neighboring states. The National Society was well represented through the attendance of Mr. H. T. McDermott, National Secretary, Mr. C. Buschkopf and Mr. Fred Roth of the National Board of Directors, and Mr. E. A. Plesskott, National Membership Committee.

The entire affair was staged on the second floor of the Leland Hotel at Springfield, Illinois. The exhibits were confined to one room, while the meetings and entertainment were held in the ballroom across the lobby. Much

credit for the success of the affair is given the fine display produced by the exhibiting manufacturers and jobbers, totaling eleven in all, as follows:

List of Exhibitors

Springfield Refrigeration Supply Co., Springfield, Ill.

Imperial Brass Manufacturing Co., Chicago, Ill.

F. H. Langsenkamp Co., Indianapolis, Ind.

United States Electric Co., Springfield, Ill.

Automatic Products Co., Milwaukee, Wis.

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Herman Goldberg Co., representing:

Ansul Chemical Co., Marinette, Wis.

Ranco, Inc., Columbus, Ohio.

Republic Electric Co., Davenport, Iowa.

White-Rodgers Electric Co., St. Louis, Mo.
Commercial Coil & Refrigeration Co., Chicago, Ill.

R. E. Thompson Co., St. Louis, Mo.

The meeting opened under the guidance of State President Leonard Nelson, at 12:45 p.m. on Saturday, October 1, and the first item on the program was the showing of the General Electric sound film, "They Know How." This film portrays the manufacture and assembly of the G. E. refrigerator. This was followed by an exceedingly interesting educational program in the order named:

Slides and movies on the Westinghouse Sterile Lamp, presented and explained by Mr. Carl Pilger.

Modern Trends of Refrigeration and Air Conditioning and Their Effect on the Service Man. A paper presented by Mr. P. B. Reed, of Servel, Inc., Evansville, Ind.

Sound film "Heat and Its Control" by Mr. Patrick, Johns-Manville Corp.

During the time the men were being entertained by the foregoing, the ladies were entertained with cards and bunco, through the arrangement of Mrs. L. Kline, chairlady, and her committee. Approximately nine prizes were awarded in these games.

During the evening, both ladies and men were entertained with a dinner dance and entertainment. Chicken was served for dinner, with rubber balloons as an appetizer. After chasing the balloons all over the room, many of the guests had more than doubled their appetite. With Mr. George Monjian, Chicago, acting as Master of Ceremonies, several acts of entertainment and dancing followed the dinner.

The second day's program opened with

greetings from the National Society, presented by Mr. H. T. McDermott, National Secretary, followed by the presentation of the charter to the State organization. An enjoyable diversion from the ordinary run of business was the presentation of the charter and obligation to the Springfield Chapter. Approximately 16 of the chapter members were present to receive this obligation, as delivered by Mr. McDermott.

Speakers on Second Day

Following this were several interesting talks on the following subjects:

"Modern Tools" by Mr. Geo. Franck, Imperial Brass Mfg. Co.

Short talk by Mr. Mel Knight, Peerless of America, Inc.

Film and explanation of "The Polartron System" by Mr. Pride and Mr. Charles Cochran, Minneapolis-Honeywell Regulator Co. Introduction of, and comments by:

Mr. Ray Polley, Mills Novelty Co.

Mr. Frank Fillo, White-Rodgers Electric Co.

Mr. William Gauger, Commercial Coil & Refrigeration Co.

Mr. Robert Cook, Ranco, Inc.

Last, but by no means least on the program, were some very interesting movie shorts, which have been taken by Mr. Herman Goldberg.

The ladies during this time were entertained with a luncheon and a trip to Old Salem Park, and then to Lincoln's home.

A Board of Directors' meeting occupied the officers of the Association during the rest of the day. Due to lack of time, election of officers was not held, but was deferred to a later meeting. Temporary officers, therefore, are as follows:

Mr. Leonard Nelson, *Temporary President*.

Mr. Eugene White, *Temporary Secretary*.

Mr. Fred Roth, *Temporary Treasurer*.

Temporary Board of Directors:

Mr. E. W. McVay, Springfield Chapter.

Mr. A. L. Hammond, Springfield Chapter.

Mr. Willis Stafford, Tri-County Chapter.

Mr. W. W. Larson, Rockford Chapter.

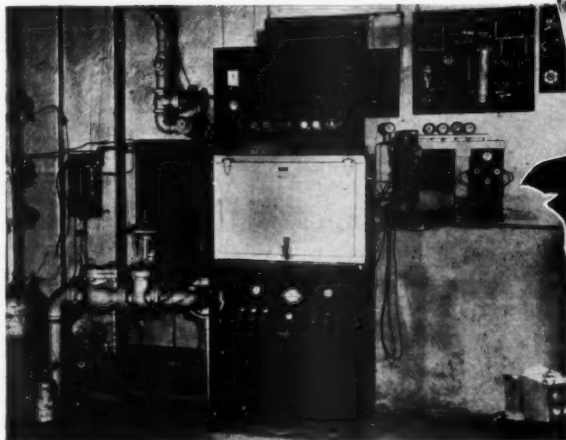
Mr. R. C. McCarthy, Rockford Chapter.

Mr. George Monjian, Chicago Chapter.

Mr. E. F. Fredericks, Member-at-Large, Galesburg, Ill.

Springfield Chapter, as the newest Chapter in the State up to the time of the convention and the host for this first convention, is to be congratulated on the arrangements made. Mr. E. W. McVay, president of Springfield

HERE'S A WAY to make MORE Profit



LARRY LEHAN
Service Manager
General Equipment
Corp.
Boston, Mass.

THIS carefully-planned and well-built master test panel has done plenty to increase Service Department efficiency at the General Equipment Corporation, Boston, Mass.

Any shop can be made more efficient and profitable by improving its testing equipment.

And the refrigerant you use in servicing is important, too. In his letter describing the details of his test panel, Mr. Lehan says, *"Our entire supply of refrigerants used in our Service Department is obtained through the facilities of the Virginia Smelting Co., to whom we wish to express our sincere appreciation for prompt service and satisfaction."*

Service engineers all over the world depend on Virginia Extra Dry Esotoo and V-Meth-L for Prompt Delivery as well as Quality.

Send a postcard for any or all of the following: Details of the test panel illustrated, or our booklets "Refrigerant and Lubricant Data" and "Tabulated Properties of Various Refrigerants."

EXTRA DRY ESOTOO • V-METH-L

VIRGINIA SMELTING CO., West Norfolk, Virginia

SO EASY TO SERVICE!



*When the refrigerant
is **ARTIC***

ACCIDENTAL introduction of moisture, which often occurs in field-assembled units, may be taken care of by use of dryers when ARTIC is the refrigerant. That's just another reason why Service Men find ARTIC a most convenient refrigerant. Write for information and list of distributors. E. I. du Pont de Nemours & Co., Inc., R. & H. Chemicals Dept., Wilmington, Del.



Artic
REG. U. S. PAT. OFF.

**THE PREFERRED METHYL CHLORIDE
FOR THE SERVICE MAN**

October, 1938



THE REFRIGERATION

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J. W
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Fred
Kenn
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E. L
Mrs.
Mrs.
Wm.
Mrs.
Man
D. I
John
Har
C. E
M.
Mrs.
J. A
Mrs.
Joe
Jam
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Chapter, ably assisted by Archie Fait of the United States Electric Co., chairman of the Program Committee, and A. L. Hammond, secretary of the Chapter, as well as the members of the Chapter, did a creditable job in completing arrangements.

An invitation was extended by Rockford for the holding of the next annual convention.

Committee chairmen for the Springfield convention included:

S. Grosberg, Springfield—*Registration*.
Herman Goldberg, Chicago—*Publicity*.
E. H. White, Elgin—*Exhibits*.
Mrs. J. J. Kline, Springfield—*Ladies*.
Archie Fait, Springfield—*Educational*.
P. W. McVay, Springfield—*Hotel*.
George Monjian, Chicago—*Program*.

REGISTRATIONS AT ILLINOIS CONVENTION

Robert M. Anderson.....	Chicago
E. A. Bapp.....	Springfield
Mrs. E. A. Bapp.....	Springfield
J. W. Barnes.....	Springfield
Mrs. J. W. Barnes.....	Springfield
Fred Barney.....	Rockford
Kenneth Beatty.....	Springfield
Mrs. Kenneth Beatty.....	Springfield
E. L. Bengtson.....	Davenport, Iowa
Mrs. E. L. Bengtson.....	Davenport, Ia.
Wm. G. Benner.....	Springfield
Mrs. Wm. Benner.....	Springfield
Manuel Brown.....	St. Louis, Mo.
D. K. Burbank.....	Springfield
John Burge.....	Chicago
Harry D. Busby.....	Chicago
C. Buschkopf.....	Beaver Dam, Wis.
M. F. Corrington.....	St. Louis, Mo.
Mrs. M. F. Corrington.....	St. Louis, Mo.
J. A. Cassidy.....	Indianapolis, Ind.
Mrs. J. A. Cassidy.....	Indianapolis, Ind.
Joe W. Cavataio.....	E. St. Louis
James Cernohonz, Jr.....	Chicago
Mrs. J. Cernohonz, Jr.....	Chicago
Beryl Clark.....	Aurora
Mrs. Beryl V. Clark.....	Aurora
Nick Clement.....	Chicago
R. W. Cook.....	Columbus, Ohio
T. E. Cunningham.....	Chicago
R. I. Dobbins.....	Springfield
L. I. Doing.....	St. Louis, Mo.
G. W. Dresback.....	Normal
Mrs. G. W. Dresback.....	Normal
Floyd Duvall.....	Chicago
Mrs. Floyd Duvall.....	Chicago
Roy Ehrsam.....	Charleston
A. L. Fait.....	Springfield
Mrs. A. L. Fait.....	Springfield
A. H. Fine.....	Chicago
E. J. Ford.....	Kewanee
Mrs. E. Ford.....	Kewanee
G. E. Franck.....	Chicago
Mrs. G. E. Franck.....	Chicago
E. F. Fredericks.....	Galesburg
G. William Gauger.....	Chicago
Mrs. G. William Gauger.....	Chicago
Herman Goldberg.....	Chicago
E. D. Goodfellow.....	Bloomington
J. D. Gray.....	E. St. Louis
J. E. Green.....	Chicago

ON PAGE 50 IS A VIEW OF THOSE ATTENDING THE DINNER DANCE DURING THE ILLINOIS STATE ASSOCIATION MEETING OF OCTOBER 1-2.

Speaking of BUFFALOS



DOES THE BUFFALO

on a nickel face right or left? While we don't want to buffalo you fellows into reading our ad, we'd like to interrupt your pocket research long enough to remind you that Automatic's prices, complete stocks, experienced personnel and quick delivery take all the guesswork out of buying parts and supplies for your refrigeration and air conditioning jobs.

THIS CATALOG HELPS YOU SELL



Our list price system enables you to sell to customers direct from this catalog without disclosing your confidential prices.

Send for copy

SAVE ON THERMOMETERS AND HYDROMETERS

Write for new catalog describing thermometers and hydrometers for every industrial application. Compare our prices and save!



AUTOMATIC HEATING & COOLING SUPPLY CO.

647 West Lake Street

Chicago, Illinois

J. E. Green.....Springfield
 Mrs. J. E. Green.....Springfield
 D. E. Greig.....Springfield
 Edw. P. Greig.....Springfield
 Sylvester Grosberg.....Springfield
 Mrs. Sylvester Grosberg.....Springfield
 A. L. Hammond.....Springfield
 Mrs. A. L. Hammond.....Springfield
 Mrs. B. E. Hamrick.....Quincy
 Everett F. Hansen.....Racine, Wisc.
 Mrs. E. F. Hansen.....Racine, Wisc.
 C. L. Hartman.....Rock Island
 W. F. Hauber.....Chicago
 Cyril Holdreith.....Springfield
 L. W. Huff.....Clinton
 Mrs. Laura Huff.....Clinton
 Edward Hunt.....Rockford
 Robert Jessenberger.....Springfield
 Hans Jensen.....Chicago
 Mrs. Evelyn H. Johnson.....Decatur
 John Jones.....Chicago
 Eugene Kresse.....Springfield
 Mrs. Eugene Kresse.....Springfield
 H. C. King.....Charleston
 Ralph B. King.....Decatur
 Mrs. Ralph B. King.....Decatur
 James Kline.....Springfield
 Mrs. J. Kline.....Springfield
 M. W. Knight.....Chicago
 Mrs. M. W. Knight.....Chicago
 Walter W. Larson.....Rockford
 Mrs. Walter W. Larson.....Rockford
 C. F. Linderman.....Springfield
 R. C. McCarthy.....Rockford
 Mrs. R. C. McCarthy.....Rockford
 H. T. McDermott.....Chicago
 W. L. McFain.....Springfield
 A. D. McGill.....Peoria
 Mae E. McGill.....Peoria
 Thomas C. McKee, Jr.....Chicago

J. F. McKenna.....St. Louis, Mo.
 P. W. McVay.....Springfield
 Mrs. P. W. McVay.....Springfield
 Roy W. Massey.....Granite City
 W. C. Metcalf.....Joliet
 Mrs. W. C. Metcalf.....Joliet
 W. Meyer.....Chicago
 George Monjian.....Chicago
 Mrs. Geo. Monjian.....Chicago
 J. G. Moravec.....Moline
 Mr. L. C. Nelson.....Galesburg
 Mrs. L. C. Nelson.....Galesburg
 T. C. Norton.....St. Louis, Mo.
 Earl J. O'Brien.....St. Louis, Mo.
 John H. Packard.....Springfield
 Adolph J. Pasquale.....Riverton
 L. C. Pellegrini.....St. Louis, Mo.
 Ray Pennington.....Springfield
 Carl F. Pilger.....Chicago
 E. A. Plesskott.....St. Louis, Mo.
 Ray F. Polley.....Chicago
 G. R. Postlewait.....St. Louis, Mo.
 R. M. Potter.....Springfield
 Mrs. R. M. Potter.....Springfield
 Harold K. Pride.....Des Plaines
 Mrs. H. K. Pride.....Des Plaines
 Paul B. Reed.....Evansville, Ind.
 Mrs. P. B. Reed.....Evansville, Ind.
 Cliff Reynolds.....Rockford
 LeRoy J. Rioux.....Waukegan
 Mrs. L. J. Rioux.....Waukegan
 Clare Ross.....Bushnell
 Mrs. C. Ross.....Bushnell
 Fred H. Roth.....Chicago
 John H. Sackey.....Galesburg
 Mrs. John H. Sackey.....Galesburg
 E. W. Scotten.....Chicago
 Earl J. Seaton.....Rockford
 Mrs. Earl J. Seaton.....Rockford

You pay little more for a gauge you can KEEP accurate

No one—not even Marsh—has ever been able to build a gauge that can't be knocked, kicked or banged out of adjustment. In this connection, however, there are two important differences between the Marsh Gauge and the ordinary kind:

- (1) The Marsh Gauge will take a lot more punishment **BEFORE** it goes out of adjustment.
- (2) The Marsh Gauge can be brought back to its original accuracy with the twist of a screw driver—and we mean **BROUGHT BACK**.

When a gauge is knocked out of adjustment in practically all cases the inaccuracy is caused by distortion of the bourdon tube. Resetting the pointer or moving the dial obviously won't correct this distortion, and therefore such methods won't correct the gauge for **ALL** points on the dial. The Marsh "Recalibrator" **WILL** correct it—will restore accuracy at all points—will actually **RECALIBRATE** the gauge. This feature is now available in all Marsh Gauges. You pay little more for this gauge than you can **KEEP** accurate than for any other quality gauge.

Write for catalog covering Marsh Refrigeration Instruments.

JAS. P. MARSH CORPORATION

2059 Southport Avenue, Chicago, Ill.

MARSH Refrigeration Instruments
 GAUGES—THERMOMETERS—RECORDERS—MERCURY SWITCHES



Miss Monica Sehy.....	Springfield
Ivar Skipple.....	Chicago
Mrs. Betty Skipple.....	Chicago
R. E. Sloas.....	St. Louis, Mo.
Willis Stafford.....	Aurora
Mrs. Willis Stafford.....	Aurora
Geo. Stebbins.....	Galesburg
Mrs. H. Stebbins.....	Galesburg
John Stoppelwerth.....	Springfield
Mrs. J. Stoppelwerth.....	Springfield
Clarence A. Teagarden.....	Galesburg
Mrs. C. A. Teagarden.....	Galesburg
R. E. Thompson.....	St. Louis, Mo.
G. M. Turk.....	Kenosha, Wis.
Mrs. G. M. Turk.....	Kenosha, Wis.
P. A. Von Zuben.....	Belvidere
Mrs. P. A. Von Zuben.....	Belvidere
Bert Weber.....	Pawnee
Mrs. Bert Weber.....	Pawnee
Eugene H. White.....	Elgin
Mrs. Dorothy A. White.....	Elgin
Howard Wilderman.....	E. St. Louis
Jerry Wilkerson.....	St. Louis, Mo.
H. A. Willetts.....	Rock Island
Frank H. Wolcott.....	Kewanee
Mrs. Frank Wolcott.....	Kewanee

ROCKFORD CHAPTER SECOND ANNUAL PICNIC

THE Rockford Chapter held their annual picnic at Macktown Forest Preserve. The Picnic Committee put a lot of hard work

into the plans, and everyone had a good time. There were 108 in attendance, including a delegation from the Madison, Wisconsin, Chapter.

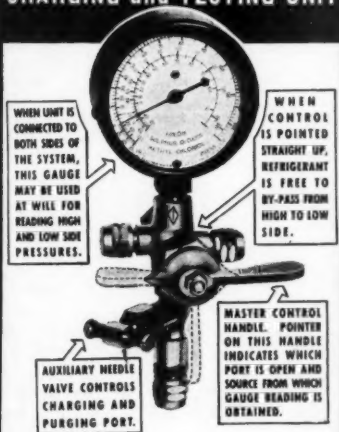
The crowd started to gather about ten o'clock in the morning. As there was a soft ball game between the Rockford and Madison groups scheduled for the afternoon, we proceeded to whet our appetites with a little batting practice before dinner.

The dinner was put on by the Society and financed by ticket sales. We had a real "Feed" consisting of baked beans, potato salad, bread, and cold meats and cheese for sandwiches, coffee, cake, and ice cream.

When everyone had consumed his full capacity we retired to the lawn to take a little rest and draw for attendance prizes. There were just enough prizes to go around at one prize for each family. There were also several additional prizes for the children, which were given as awards to the winners of races.

As it was getting along in the afternoon, we got our teams together for the soft ball game. The batteries for Madison were—

HI-LO — a new type of CHARGING and TESTING UNIT



No. 500-C Imperial Hi-Lo Charging and Testing Unit, complete with 2 1/2" gauge. Each \$5.25
No. 501-C Same, less gauge. Each \$3.35

Combines all the advantages of a double gauge unit with the lightness, compactness and ease of handling of a single gauge unit . . .

• This is an entirely new type of charging and testing unit which uses a single gauge and a single valve for reading pressures on both sides of the system. It is totally different in operation from the ordinary single gauge unit, and it will do everything a double gauge unit will do.

Offers the following special advantages:

1. When connected to both sides of the system it permits reading the pressure on either the high side or the low side at any time with a single gauge and a single valve.
2. It permits by-passing at any time without capping the charging and purging port.
3. It may be used separately on either the high side or the low side with exceptional convenience.
4. It is considerably lighter than other units for similar work, fits into closer space and is easier to carry.

This unit can be used for the same variety of purposes as any double gauge or any single gauge unit. Method of operation is simple and convenient (see illustration at left). Once you try the new HI-LO unit we believe you'll agree that it's the handiest and most efficient charging and testing unit you ever used!

Write for new circular.

IMPERIAL BRASS MFG. CO.
1204 W. Harrison St., Chicago.

ORDER FROM YOUR JOBBER

IMPERIAL Air Conditioning and Refrigeration Products

VALVES • FITTINGS • TOOLS • CHARGING LINES • FLOATS • STRAINERS • DEHYDRATORS



Maurice (Monk) Bakken and Gustave A. (Gus) Larson; for Rockford, Henry (Hank) Genin and Walter (Walt) Larson. Everyone was "heavy on the bat," and errors were plentiful in the field. There was a lot of

good-natured ribbing but it was a lot of fun for everyone.

The party then broke up to allow everyone to go home and put liniment on their stiff joints.

SUCCESS to the R.S.E.S.

AND THEIR 5th ANNUAL CONVENTION

*May this one be bigger
and better than ever*

... SEE YOU AT BUFFALO

H. CHANNON COMPANY

133 N. WACKER DRIVE • CHICAGO, ILL.

WRITE FOR CATALOG

BOB SAYS, "HERE'S PROOF!"

It seems Bob Anderson (that genial personality who contacts many midwestern jobbers and servicemen in the interests of the Imperial Brass Manufacturing Co., Chicago), has told some tall fish stories that apparently have not been accepted at face value, because Bob has, on most occasions, neglected to furnish the proof of his piscatorial



Reading Left to Right Are: Bob Anderson, Mrs. Anderson, The Fish.

accomplishments. In publishing the above photo, Bob hopes this will conclusively settle the matter, and as further evidence, he has obtained a sworn statement from the captain of the boat, testifying as to the authenticity of the above catch.

TRY VENTING YOUR FEELINGS THIS WAY

THE following poem is a contribution from Mr. H. W. Custer, of Centerline, Mich. Mr. Custer states that this is the result of an actual experience encountered by him. He was so thoroughly disgusted with his experience that he had to resort to poetry to adequately describe it.

Frost on the Suction Line

The day was cold and rainy,
A call came at the shop
To come and see about a box
That suddenly had stopped.

The house was in the country,
A seven mile drive

Snap-on

SPECIALIZED TOOLS
FOR REFRIGERATION SERVICE

• Double-broached Boxocket walls give double the gripping points of an end wrench—require only half the space for handle movement.

The XS-5 set illustrated is a most practical assortment of Dwarf Boxockets for ten nut sizes ranging from $\frac{3}{8}$ " to $\frac{3}{4}$ " inclusive.

Every tool kit needs this complete set. Once you use them, you'll wonder how you worked without them. Available only through our own branch distributing warehouses located in 37 principal cities. See Snap-on Tools Corp. in your telephone directory or send coupon.

SNAP-ON TOOLS CORP., Kenosha, Wis.

BOXOCKETS
DO IT
BETTER!



SNAP-ON TOOLS CORPORATION,
KENOSHA, WIS.

- ☐ FREE—special literature on refrigeration tools; also 160 page catalog.
☐ Show me XS-5 Boxocket Set.

NAME

ADDRESS

..... RSE-10

SERVICE ENGINEER

55

October, 1938

I cranked the bus a full half-hour
Before it came alive.

I drove up to the farmhouse,
A' soaked right to the skin,
A mongrel dog came after me
But I slammed the door on him.

This job sure was an antique,
And I wondered in my mind
Just why the thing had run at all
And cooled itself besides.

The compressor was a-leaking,
The flywheel wouldn't turn,
The motor was a failure,
When plugged in it would burn.

The belt was frayed to pieces,
The box was moisture-swelled,
The freezer had half-fallen down,
And the food compartment smelled.

I tried to close the valves off,
The discharge snapped in two,
A cloud of sulphur came at me
And caught me fair and true.

I finally clamped a pinch-off
Onto the tubing end,

But not before half the gas
Had left before the mend.

I pulled the unit from the box,
This trip sure was a flop,
I'd look the darn thing over good
When I got to the shop.

I staggered out into the rain
And started for the car,
But the mongrel dog caught up with me
Before I had gone far.

I left that place a ragged bum,
And swore that I would quit
This service game for sure next day,
But here I'm still at it.

—H. W. Custer.

TRI-STATE CHAPTER HOLDS PICNIC

ON Sunday, September 18, 1938, the members of Tri-State Chapter with their wives, sweethearts, children and friends gathered at Camden Park, Huntington, West Virginia, for their first annual picnic. Games were played until dusk when all

FOR COMMERCIAL USE Mills Compressors

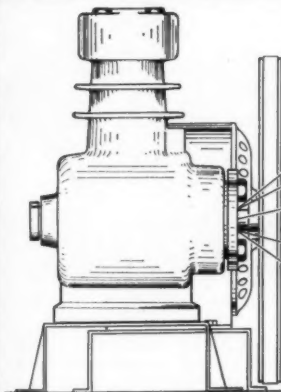
★ Mills Novelty Company

4100 Fullerton Avenue, Chicago, Illinois

SOLD ONLY THROUGH SERVICEMEN, DEALERS, AND DISTRIBUTORS



TRI-STATE CHAPTER'S FIRST PICNIC Held September 18, 1938. Appearing from left to right in the first row are: Marion May Harrison, John Harrison, Francis Gruber, Sidney Elam, Margaret Smoot, Sarah Harrison, Bob Albertsen. Second row: Mrs. Roy McElhane, Mrs. Carl Ackley, Mrs. Charles Elam, Mrs. M. E. Harrison, Mrs. Claude (June) Brunton, Mrs. A. W. Gruber. Third row: Leona Cottle, Mrs. John Smoot, Mrs. C. H. Cantrell, Mrs. Donald Young, Betty Scott, Jeanne Albertsen. Fourth row: Prindle Jones; A. W. Albertsen, secretary; Claude Brunton, president; J. C. Cottle, 2nd vice-president; Carl Scott, C. H. Cantrell. Fifth row: Carl Ackley, director; Donald Dameron; Charles Elam; John Smoot, director; A. W. Gruber, 1st vice-president; Donald Young, director; Ollie Rose, director; M. E. Harrison, treasurer.



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SYNTRON

**SELF LUBRICATING
SELF CENTERING
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SHAFT SEALS

**Stop Leaking Shafts
for Once and for All**



**Now Available for Practi-
cally All Makes of Compressors.**

At New Low PRICES.

Order from your Jobber

SYNTRON CO., THOMAS BLVD., HOMER CITY, PA.

sat down to a wonderful picnic dinner prepared by the wives of the members. After dinner a Bingo party was held in the pavilion.

Everybody present had an enjoyable afternoon and evening the only regret being that due to pressure of work, quite a few members could not be present.

§ § §

ST. LOUIS CHAPTER PICNIC

ST. LOUIS Chapter can be credited with another successful picnic held Sunday, Aug. 21st at Pevely, Mo. The location this time was Cedar Lake—which proved ideal, inasmuch as there was plenty of level ground for games, and also swimming facilities. For those who liked to hike, the nearby woods offered much pleasure, as well as soft ball, baseball, and horseshoe games, for those who desired more strenuous exercise.

The big event in the afternoon was the Fish Fry and Wiener Roast, which was well received by all—with the possible exception of the fish cleaner in chief, E. A., who thought he would never get through. (He nearly got left when it came to the eating of same.) Credit must be given to the

wives of the officers for their able assistance in the commissary department.

Many of the hundred or more individuals present complimented the General Picnic Chairman, President Vollman, and his committee, consisting of Messrs. Fix, Haney, Petrie, Steinkamp, and your correspondent, as being the best picnic to date, and expressed the hope that another one would be held next year.

As usual this picnic was made possible by the splendid cooperation of The Harry Alter Co., Brass & Copper Sales Co., The Spangler Co., Inc., and the R. E. Thompson Co., who were given a vote of thanks for their financial support, as well as the Ansul Chemical Co., of Marinette, Wis., for their generous supply of the fish.

§ § §

ON PAGE 59

VIEWS OF ST. LOUIS CHAPTER PICNIC.

1—Help Wanted—out but not down. 2—Secretary Plesskott is apparently telling Mr. Thompson something of interest. 3—S. Mohlen, Jr., of R. E. Thompson Co. 4—Fish frying with the vultures ready to grab them. 5—Officers and workers "mess" and we do mean mess. 6—What a swing—hope Connie Mack's scouts take notice. 7—The sharks at play. 8—Grand opening with Vice-Pres. Fix looking on. 9—A mighty thirst. 10—Bet it will be a homer.



"Chieftain"

Quality Built

Compressors and

Condensing Units



are designed to give you many years of quiet, efficient and trouble free service by Engineers who have been serving the refrigeration industry for the last fourteen years. They have again "scored a hit" with a new "V" type four cylinder compressor which is designed for use with $\frac{1}{2}$ to 1 HP motors. All of the advanced features that have proven so successful in "Chieftain" household and light commercial units are now incorporated in this new four cylinder model. Mechanical improvements include, force feed lubrication to piston pin and connecting rod bearings, positive alignment of cylinder bores with main bearings by casting cylinders and crankcase in one piece. Adjustable suction shut-off valve, interchangeable parts with single and twin cylinder models. All compressor parts are machined to precision limits on up to date equipment and assembled in glass enclosed rooms where only filtered, dust free air is admitted.

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TO SERVE YOU **7**

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161-163 Grand St.

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Chapter Notes

COLUMBUS CHAPTER

September 27—With the exception of a short business session, the entire evening was devoted to the election of officers for the coming year. The following were elected:

Robert J. Creamer, *President*

R. C. Kaiser, *Vice-President*

Nedford K. Mason, *Secretary*

R. W. Valentine, *Treasurer*

Under the guidance of Mr. Joseph P. Merkel, educational chairman, an interesting program for the coming year is being planned. Considerable work is being done on this program at the present time.

TRI-COUNTY CHAPTER

August 19—With Mr. Willis Stafford presiding over the meeting, it was called to order in the Woodruff Hotel, in Joliet, and as the first feature of the evening, State Representative, Mr. Leonard E. Wood, was introduced, and he proceeded to give some very interesting facts about legislative procedure. A discussion of the fall educational program followed, with the following topics suggested: (1) The Servicing of Soda Foun-

tains, by a representative of the Liquid Carbonic Corp.; (2) Refrigerants, by Mr. E. W. McGovern; (3) More information on motors; (4) One meeting devoted entirely to safety. This provided a very good start for the Educational Committee to work on during the coming year.

September 16—The entire evening was devoted to a tube bending contest, and all regular business was suspended. A total of five contestants competed in this contest making it a very interesting and educational feature. Mr. William Metcalf, of Joliet, was the winner. The Imperial Brass Manufacturing Co., represented by Mr. George Franck, furnished the necessary fittings, and later on, Mr. Franck gave a demonstration of the company's latest refrigeration tools. This affair was also attended by the ladies, who enjoyed a card party while the contest, etc., was in progress. After the card party, a steak fry was enjoyed by all.

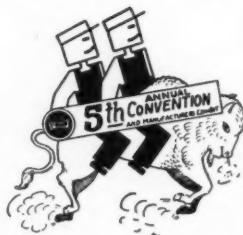
WICHITA CHAPTER

August 5—Due to the illness of Mr. F. W. Ryan, president of the chapter, the meeting was conducted by Vice-President G. B. Govits. Introduction of visitors of the evening included Mr. Carl Hervy, Mr. Riley and

Merrily we roll along

on

ROTARY
SEALS



We are on our
way to Buffalo
to the convention to meet all
our service engineer friends

We'll be seeing you in Booth 5

Mr. George Richards. The educational program of the evening consisted of an open discussion on service problems. Many fine contributions were made to this discussion, and much was learned by the members.

September 9—In the previous meeting, the membership had voted a bouquet of flowers to be sent to President Ryan, who was confined to his home with illness. A letter of thanks for the flowers was received from Mrs. Ryan and read at this meeting. The meeting was conducted again by Vice-President Govits, and the educational program consisted of a further discussion on service problems, and the answering of questions in the Question Box.

September 23—Mr. Ryan is reported as being considerably better, and is able at this time to stay a short time each day at his office. There was little business to be conducted for the evening, and the greatest part of the time was devoted to discussions.

CHICAGO CHAPTER

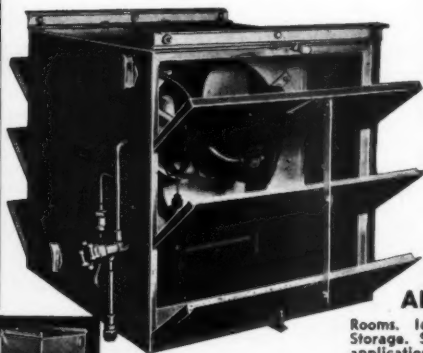
September 13—We are back at the meetings again after a two-months' vacation,

and, of course, the first meeting night had to be plentifully supplied with rain and cold weather. However, inclement weather does not seem to daunt Chicago Chapter members, for we had a fairly good turnout. The meeting was called to order by President Fred Roth at 8:30 p. m., with the roll call of officers, the reading of the minutes of the last meeting, and a reading of correspondence. This was followed by a resume of new and old business, of which the State Association business was the most important. The meeting was then turned over to Geo. Monjian, chairman of the entertainment committee, who called first on Mr. George Franck, of the Imperial Brass Manufacturing Co. Mr. Franck spoke about, and demonstrated a new service gauge valve being manufactured by the Imperial Brass Manufacturing Co. Next, Mr. Ray Johnson, of Borg-Warner Corp. was called. Mr. Johnson introduced the Borg-Warner employees present, and then proceeded to read a comical thesis, which he used to put across a sales point, sales being the basis of his speech. Both speakers were very well heard, and very much enjoyed by the members. This was followed by an extra good

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show and excellent refreshment, supplied by the Imperial Brass Manufacturing Co. and Borg-Warner Corp., and everyone went home feeling it was an evening well spent, thanks to Mr. George Franck and Mr. Ray Johnson.

September 27—No business was discussed, with the exception of a reminder of the dues being payable. The evening was given over to a smoker and show, under the direction of Geo. Monjian, which was really very good. There were 140 members and friends present, and it is a certainty all were pleased, for if they didn't get their stomachs full of refreshments, they got their eyes full of show. And, Herman Goldberg, P. S. (picture snapper) was there and took several reels of motion pictures of the show, and the assembly, which will probably be shown soon after development. This fellow Goldberg, and his camera, are fast becoming a problem. Honestly, nothing is sacred to him and anybody or anything makes a good picture to him.

DAYTON CHAPTER

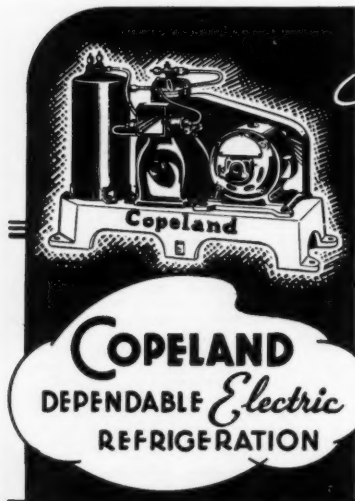
August 19—With President E. O. Bowman presiding, the meeting came to order

and a short business session followed, after which some discussion arose as to Mr. J. Becker's invitation to meet at his place at 610 Richard St., on September 2. The invitation was accepted, and Mr. Becker notified accordingly. The meeting was then turned over to the Educational Committee, which produced some very interesting features for the remainder of the evening.

September 16—One of the main points of business for the evening was the election of the delegate and alternate to attend the National Convention, November 2-3-4. The results of this election were: Mr. H. Shoupp, delegate and Mr. Charles Price, alternate. A discussion followed on the forthcoming membership drive, in which Mr. J. Homan and Mr. H. F. Pottenger were elected as team captains.

TRI-STATE CHAPTER

September 12—The meeting was called to order by President Claude Brunton, with a fine representative group from the chapter on hand. After considerable discussion, it was decided that a picnic would be held on Sunday, September 18, starting at 1:30



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Copeland Refrigeration Corporation, SIDNEY, OHIO

p. m., at Camden Park, in Huntington. Further business of the evening consisted of the appointment by President Brunton of a Nominating Committee, which was charged with the responsibility of presenting the names of members at the October 3rd meeting, who would be considered for election as candidates for the National Convention.

LOS ANGELES CHAPTER

September 13.—This meeting was held at the Nika-Bob Restaurant, with about 40 members present. President W. W. Allison presided, and immediately proceeded with the business of the evening. Tentative arrangements were made for the next meeting to be held on Sunday, September 30, at Eaton's Chicken House, on Wilshire Blvd. A suggestion followed that a dinner dance be held some time in October. Mr. Payne volunteered to construct a box to be used as a Question Box at future meetings. After some discussion, it was decided this would be a desirable feature and would permit members to present their problems for discussion at each meeting. Mr. Darby, the National Sergeant-at-Arms, was elected as delegate to attend the National Convention

at Buffalo. Following this, committee members were appointed, as listed below:

Educational Committee: J. C. Blair, W. E. Young, J. R. Payne.

Entertainment Committee: J. E. Salisbury, G. R. McLay, W. A. Myers.

Membership Committee: W. Wallace, A. C. Line, A. L. Lafferty.

Municipal Relations, Codes, Regulations, etc.: L. P. Roth, F. W. Gillette, P. J. Keifer.

INDIANAPOLIS CHAPTER

September 13.—This was the opening meeting of the fall season, and a very good attendance was had. Mr. Daniels, of the Fedders Manufacturing Co., gave a very interesting talk, which was accompanied by pictures, and was enjoyed by all those present. Although refreshments were supplied for a much larger gathering than turned up, it was interesting to note that none went to waste.

TOLEDO CHAPTER

September 11.—On this date, members, friends and families of the Greater Toledo Chapter No. 1, attended a basket picnic and steak roast at Sunset Park, Waterville, Ohio. An enjoyable time was had by all. We

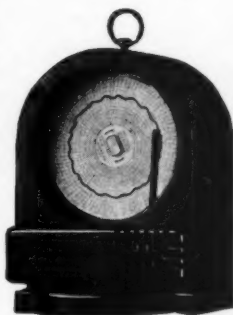
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haven't been able to find out who won the ball game as yet. One report of the score was 27 to 3 in the 14th inning, and another 30 to 2, so we gave up at that. One thing noticed was Fred Rudolph playing with one hand, trying to keep whatever he had in the other from spilling, which after some recollection, was general practice among other players.

September 21.—The regular meeting of the Chapter was held at Redman's Hall. President A. J. King presided, and the business of reading minutes, together with reports of committees proceeded. The Entertainment Committee informed the members that a dance was being planned for the near future. After a due discussion and election, Mr. King was elected as delegate and Mr. F. A. Rudolph as alternate to represent the Chapter at the Buffalo Convention. In the educational program of the evening, the Minneapolis-Honeywell local representative showed motion pictures of the different types of controls manufactured by them and gave a very thorough explanation.

MILE-HIGH CHAPTER

September 14.—The main business of this evening consisted of the election of permanent officers, which resulted in the following:

John K. Lind, *President*.
L. W. Martin, *Vice-President*.
H. R. McCombs, *Secretary*.
E. L. Huff, *Treasurer*.
William Rieter, *Sergeant-at-Arms*.

A committee was also appointed to determine a permanent meeting place before the next meeting, and to decide on an educational program. Seven new applications were received at this meeting, and the Chapter feels confident that within one year, the membership can be more than doubled.

ONTARIO MAPLE LEAF CHAPTER

August 12.—The business of this evening was devoted entirely to the election of officers for the current year, which resulted in the following:

G. A. Burns, *President*.
H. Donnell, *1st Vice-President*.
W. Roberts, *2nd Vice-President*.
H. F. Nye, *Secretary*.



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Other offices in principal cities

A New HANDY TOOL
made especially for
SERVICE MEN

ONLY \$7.50

This tool will eliminate makeshift devices for removing troublesome Norge seals, oil-thrower rings on Delco and other motors, and most sizes of Rotary seals when frozen on compressor shafts.

Constructed of cadmium plated steel, this tool is adjustable to all shaft lengths and can be adapted to a variety of uses other than those mentioned. *If your jobber doesn't carry this handy tool, write to:*

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106 Rogers Ave., Brooklyn, N. Y.

W. McKee, *Assistant Secretary.*

O. B. Frayne, *Treasurer.*

J. Spence, *Sergeant-at-Arms.*

Board of Directors: A. E. Doan, R. Turner, W. Sneath, G. Condie, W. Smallwood.

Audit Committee: W. Sneath, F. Strong, H. F. Nye.

Educational Committee: H. M. Searle, *Chairman.*

Membership Committee: H. Parish, *Chairman.*

Entertainment Committee: K. Wood, *Chairman.*

ONTARIO FOREST CITY CHAPTER

September 29.—The Ontario Forest City Chapter held their opening fall meeting at the Hotel London, Thursday evening, September 29. This meeting was changed from the scheduled date of September 23 so that arrangements could be made to have H. T. McDermott, national secretary, present. Our Chapter was very fortunate in having Mr. McDermott present to present the charter, due to the amount of work he has in connection with the Buffalo Convention, as well as his regular work. After the presentation ceremony and the receiving of the charter by

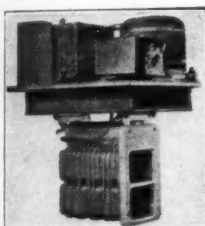
the former President, William Bevis, Mr. McDermott gave a very interesting talk on the National organization. The meeting was informal and many suggestions were received and questions asked, which will prove very helpful to individuals and to the operation of the various committees. Mr. Gordon Burns and Frank Strong of Ontario Maple Leaf Chapter were present, and contributed a good deal to the meeting. Mr. Gordon Burns is an officer of both the Toronto Chapter and the National organization.

SCRANTON CHAPTER

September 20.—After the regular business of the evening was disposed of, the meeting was turned over to the Educational Committee. Mr. Dawson and Mr. Ulbert, representing the Alco Valve Co., were then introduced, and they proceeded with a demonstration of the Alco glass evaporator, which proved of considerable interest to the members present.

KANSAS CITY CHAPTER

September 20.—The main purpose of this meeting was to start the fall and winter sessions, and to discuss the general welfare of



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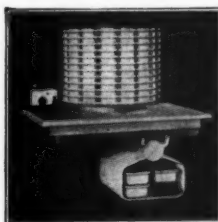
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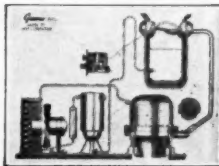
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DEPENDABLE PROTECTION

The Cesco Healthguard Fume Kit makes you immune. It is adjustable, light, soft, durable, comfortable and—inexpensive. Comes ready equipped with cartridges for Methyl Chloride (CH_3Cl), Sulphur Dioxide (SO_2), Ammonia (NH_3). Write for particulars and price, today.

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the Chapter and lay plans for future educational meetings. Some discussion followed on the suggestion that the Chapter name be changed. Nothing further was reported, however, and the matter was tabled until a future date. Convention plans were discussed, and volunteers for delegates were called for. Announcement was made that at the next regular meeting on September 27, the Minneapolis-Honeywell Regulator Co. would show motion pictures portraying their new Polartron System; also, that refreshments would be served.

PITTSBURGH CHAPTER

September 9.—After some discussion on the progress of the National Convention, a motion was made that the convention for 1939 be brought to Pittsburgh, and immediately plans were laid for the promotion of this idea. Plans were then discussed, which would tend to bring the Chapter more publicity, and Messrs. Black, Wagener, Golitz and Barnes were appointed as a Committee to work out suitable displays. The educa-

tional program for the evening consisted of a demonstration by Mr. J. Forbes and Mr. Newcum on Superior valves and fittings. At the conclusion of the demonstration, Mr. Forbes answered the questions of those present.

GILMER OPENS NEW CHICAGO BRANCH

A NEW and direct factory branch in Chicago is announced by the L. H. Gilmer Co., makers of Refrigerator belts, Tacony, Philadelphia. Removed from 665 W. Washington Blvd., the new address is 351-363 East Ohio St.

The new branch management is in charge of A. B. MacFarland, for five years assistant to the Sales Manager of the Company. He is assisted, in addition to an experienced office, warehouse, and sales staff, by a factory-trained mechanical engineer.

The Gilmer Co. claims for this move enlarged facilities for the better handling of their Mid-West business.

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**Save Money and Time—Complete
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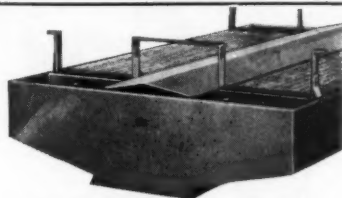
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FEDDERS NEW HIGH CAPACITY CONSTANT PRESSURE VALVE

A NEW High Capacity Constant Pressure Valve having approximately four times the capacity of the standard valve is announced by the Fedders Manufacturing Company, Buffalo, N. Y.

This Model HCP-38 valve is designed for use on air conditioning and large commercial refrigeration installations.

By accurately controlling the refrigerant pressure within close limits, it prevents the temperature of the room or cooler from dropping too low. It also prevents coils from frosting over.

By preventing the suction pressure in each coil from falling below the desired point, it makes it possible to maintain the temperature of different evaporators or coils when connected in multiple to a condensing unit.

Fedders High Capacity Constant Pressure Valves are easily adjusted and extremely accurate in control. Valve is equipped with a shut-off valve for gage and when the valve is adjusted at the desired pressure it will maintain control within a few ounces.

Large refrigerant passageways and $\frac{5}{8}$ inch orifice assure minimum pressure drop through the valve. In unusually large in-



FEDDERS MODEL H.C.P. 38 VALVE.

stallations valves can be installed in parallel to still further reduce pressure drop if necessary.



You NEED This!

This handy chart instantly shows the HEAD pressure—for ANY suction pressure at ANY room temperature for all air cooled installations using Sulphur Dioxide SO_2 , Methyl Chloride or Freon F-12. Don't guess about head pressures—secure this chart immediately. Price \$1.25. See Your Refrigeration Jobber, or send check to

R. W. Cook, Box 176, Columbus, Ohio

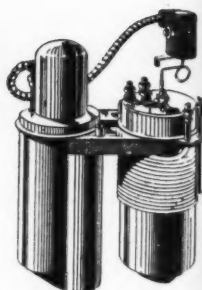


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COLTROL D-X (Left) a dry-type instantaneous cooler, and COLTROL (Right) a brine-type cooler. Both types give you perfect temperature control and perfect foam control. Either fits standard beer coil box. All refrigerants. Permits steam or chemical cleaning of beer coils. A source of quick profits for you. See your Jobber or write direct.

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Valve body is made of drop forged brass providing dense homogeneous metal structure which is proof against seepage leaks with high working pressure.

Moisture-proof hermetic seal between valve body and moulded housing prevents valve from freeze-up.

Alloy steel needle is actuated by heavy duty bellows, assuring sensitive operation and long life.

The valve is designed for use with all refrigerants except ammonia.

Capacity of Valve in Wide Open Position

Pressure Drop Lbs. Per Sq. In.	Capacity B.t.u. Hr.
.8	12,000
2.3	24,000
5.8	36,000
13.5	48,000
26.7	60,000

Inlet and outlet connection flanges are standard equipment, including tail pipes for sweating following tubes. Choice of: $\frac{5}{8}$ inch O.D., $\frac{3}{4}$ inch O.D., $\frac{7}{8}$ inch O.D., 1 inch O.D., $1\frac{1}{4}$ inch O.D.

Pipe tap connections on valve body. In-

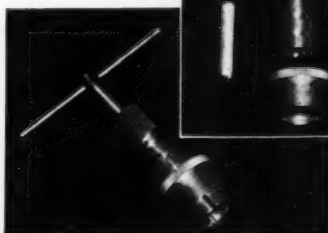
let and outlet $\frac{3}{4}$ inch female pipe thread. Complete specifications are given in Bulletin 389.

\$\$\$

A NEW TYPE OF PULLER

FILLING a long felt need in the refrigeration service industry, a new tool has been placed on the market that will eliminate makeshift devices which more often than not damage the parts they are used on. This tool will remove troublesome Norge

THE NEW TYPE PULLER.



Co-operation? YES

R. S. E. S. Members, we have appreciated yours. THANKS. See us at the National R. S. E. S. Convention in Buffalo. Yours for better Hermetic re-building.

REX REFRIGERATION SERVICE, INC.
2226 S. State Street CHICAGO

MIDEKE SUPPLY CO.

100 East Main Street
Oklahoma City, Okla.

The Southwest's Largest Supply
House of Air Conditioning and
Refrigeration Supplies



THE NEW, IMPROVED KRUPP WATER VALVE

With added New Features

Replaceable Bronze seat . . . A Sturdier Syphon Seal

A seat guide which provides perfect seat alignment

Bronze Water Valve Body

All internal parts made of Brass and Bronze to insure durability

for METHYL SULPHUR FREON

In sizes $\frac{3}{8}$ " — $\frac{1}{2}$ " — $\frac{3}{4}$ "

CYRUS SHANK COMPANY

625-631 W. Jackson Blvd., Chicago, Ill.

Manufacturers of Krupp Valves for Mechanical Refrigeration

seals and oil thrower rings on Delco and other motors and can be used to remove most sizes of seals when frozen on compressor shafts. The design of this tool provides adjustments for all shaft lengths and can be adapted to a variety of uses other than those mentioned. It is simple to operate and will remove the most obstinate seal or oil thrower ring in a few seconds.

The tool is constructed of steel and heavily cadmium plated to assure the purchaser of lasting usefulness. Servicemen claim it to be a time saver and a necessity.

For further information write to the Capson Co., 106 Rogers Ave., Brooklyn, N. Y.

\$\$\$

HENRY VALVE PROVIDE JOBBERS WITH BULLETIN BOARD

HOW a helpful attitude toward jobbers can be turned to profit by a manufacturer is illustrated in the display just released to air conditioning and refrigeration jobbers by the Henry Valve Company.

Besides its virtue as a mounting board for reprints of the company's advertisements,

the display includes a blackboard which provides the jobber with an easy and effective way to build good will and advertise products of his own choosing.

Among the uses to which the board is being



THE HENRY VALVE BULLETIN BOARD.

put are listings of close-outs, weekly standings in sales contests among counter men, notices of local trade interest, and general good will messages. Another idea gaining

TO SERVICE MEN

Thermo Air Conditioning Institute, a nation-wide organization, offers a successful and practical training program in Refrigeration and Air Conditioning . . . one recognized by engineers to be the most competent and thorough offered.

Because of this, employers are coming to the Institute for thoroughly qualified men.

If you are interested in getting ahead in this fast growing industry and would like to know more about this practical program, send post-card today. No obligation.

And you, Mr. Employer, if you are interested in securing competent trained men, write for convenient record sheet showing individual qualifications of each graduate. . . . We can supply you with one who will be trained according to your needs.

THERMO AIR CONDITIONING INSTITUTE

123 W. Hubbard St. — Sup. 0540 — Chicago

COLD CONTROLS & EXPANSION VALVES

repaired or exchanged

at the following prices, F.O.B. Chicago

Automatic Expansion Valves (All Makes) . . .	\$1.25
Thermostatic Expansion Valves	3.00
Automatic Water Valves	2.50
Domestic Cold Controls (Modern Type) . . .	2.00
Commercial Controls (Temp. or Pressure) . .	2.50
Commercial Dual Controls	3.00

ALL WORK GUARANTEED FOR 90 DAYS

Write for quantity prices

NEW DUTY

2424 Irving Park Blvd., CHICAGO

CONVENTION GREETINGS



HERMAN GOLDBERG CO.

MANUFACTURER'S AGENT

**ANSUL
REFRIGERANTS**

**RANCO
CONTROLS**

9 S. CLINTON ST.

CHICAGO

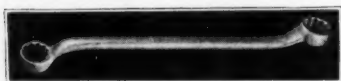
favor is that of chalking up wisecracks—the kind that bring a smile.

The display was prepared for the Henry Valve Company by the Raymond C. Hudson Advertising Agency.

\$\$\$

DOUBLE OFFSET BOXOCKET

A TOOL that will simplify many nut turning jobs when installing or servicing commercial refrigeration units is this double-end Boxocket Wrench manufactured by Snap-on Tools Corporation of Kenosha, Wisconsin. Each tool gives you two different



NEW OFFSET BOXOCKET

wrench openings, and all sizes from 7/16 inch to 1 1/8 inch are included within the range of this series.

Boxocket wrenches grip the nut on all sides—they cannot slip off and cause damage to machine or mechanic—double broaching permits their use in close places where handle movement is very limited.

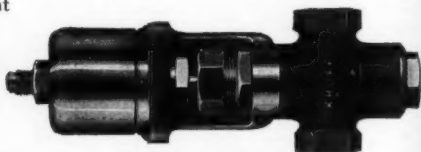
The manufacturers will be glad to send complete tool catalog free upon request.

\$\$\$

THE NEW IMPROVED KRUPP WATER VALVE

THE improved Krupp Water Valve has added several new features that make it an outstanding control.

In keeping with a bronze valve body, and internal parts made of brass and bronze to insure against rust and wear, a removable bronze seat has been incorporated so that



KRUPP WATER VALVE

replacement can be made. A seat guide provides alignment.

A heavier and sturdier syphon seal is used and the prolonged life of this valve makes it an added improvement on any water cooled unit.

CAPACITOR TEST BOX

This device is the only means of determining whether or not a Capacitor is defective. Turning the mfd. selector determines what size is necessary for replacement. The test box may be left in the circuit while a replacement is secured. We stock motor parts of all manufacturers, write for Catalog.



**COMPLETE ELECTRIC SUPPLY CO.
E. FOSTER**

526 W. Van Buren St.

CHICAGO

DOMESTIC CONTROLS REPAIRED

Ranco Pencil...	\$1.75	Cutler-Hammer ..	\$2.00
Ranco Box.....	2.00	Bishop Babcock..	2.50
Gen'l Electric...	2.00	Majestic	2.50
Tag	2.00	Penn Magnetic...	2.50

In business over 20 years.
Our name is our guarantee.

**UNITED SPEEDOMETER
REPAIR CO., Inc.**

438 West 57th Street

New York City

Take All Wheel Gear Puller

A midget with the pull of an elephant. Every serviceman and shop needs one. High grade steel. Sturdy, compact, light weight (2 lbs.). Meets practically all requirements, where a puller is used. Changeable from three to two arm puller, almost instantly.

PRICE \$4.95 F.O.B.

FLUSHING REFRIGERATION CO., INC.

133-22 41st Ave.

FLUSHING, N. Y.



These valves are manufactured in $\frac{3}{8}$ inch, $\frac{1}{2}$ inch and $\frac{3}{4}$ inch sizes for methyl, Freon and sulphur installations.

\$\$\$

NEW SCHAEFER COPPER TUBE FITTING BRUSH

SCHAEFER Brush Mfg. Company, Milwaukee, famous manufacturer of industrial brushes, announces a new brush that will be of particular interest to all men working with copper tube fittings.

The difficulty experienced in machining out the inside of copper tube fittings to make a smooth surface for soldering is a problem that has long inconvenienced workmen, plumbers, and refrigeration service men. Heretofore the only method by which the irregular inner surface of copper tube fittings could be smoothed out "on the job" was with steel wool or emery paper wound around a screwdriver or a finger.

The new Schaefer Copper Tube Fitting Brushes are made in sizes to fit standard tube diameters from $\frac{1}{2}$ inch to 2 inches. Made of tempered steel rustproof wire, one or two turns of the brushes will quickly "machine" out the inner surfaces of the tube fitting with a couple of twists of the wrist,

taking off any irregularities and producing a fine soldering surface.

Performing in a few seconds a task which heretofore required a great deal of time and adding new convenience, avoiding sore fingers and short tempers, the new Schaefer Copper Tube Fitting Brush is truly a boon to every craftsman, journeyman, and mechanic working with copper tubing.

The new brushes are especially easy to use, with a wide grip wooden handle. They are available in complete sets to take care of all standard pipe sizes.

\$\$\$

R.M.C. MOVES TO NEW QUARTERS

REFRIGERATION Maintenance Corporation has moved to its own building, one-half block from its previous location. It is now located at 821-27 East Grand Avenue in a modern building with 17,000 square feet of floor space devoted exclusively to refrigeration work.

The shop occupies the entire top floor with daylight on all four sides and incorporates the most modern equipment available. Lathes, vacuum pumps, discharge pumps, electrical testing panels, volumetric and

R. S. E. S. MEMBERS IN CANADA

We have **3** large stocks
conveniently located to
give you prompt service.

**RAILWAY & ENGINEERING
SPECIALTIES LIMITED**

MONTREAL TORONTO WINNIPEG

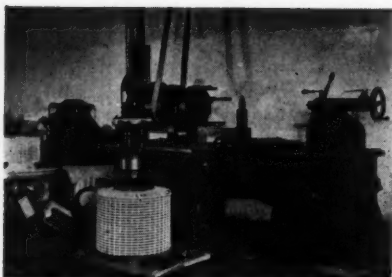


Our prices are
always right

STOP AND VISIT US

on your way to the
convention. We want
to meet you and we
want you to see our
stock on all refrigeration parts, tools,
supplies.

H. W. BLYTHE CO.
2334 So. Michigan, Chicago



Re-assembling a G. E. monitor top, Model D-60-B-86
(Commercial Unit) in our shop

Refrigerator Dealers and Service Men

Give us your
Hermetic Headaches

Complete Rebuilding and Repairs on All
Models

Specializing on Westinghouse, G. E. Monitor
Tops and Majestics

Complete Machine Shop Service

Write for Prices—Specify Makes and Models

Flushing Refrigeration Co., Inc.

HERMETIC ENGINEERS

133-22 41st AVE., FLUSHING, N. Y.

Compliments of your Jobber
in Northern Pennsylvania and
Southern New York.

Central Service Supply Co.

Associate Member R. S. E. S.

209 Jefferson Ave.

Scranton, Penn.

TED GLOU W. E. JONES

DENNIS GASKETS FOR ALL MAKES REFRIGERATOR DOORS

A complete line of
rubber - coated,
packed Gaskets and
extruded rubber Gaskets that last longer
—retain higher efficiency—because made
of finest materials and workmanship.
Write for free samples, giving your job-
ber's name and address.

W. J. DENNIS & CO.

2110-20 WEST LAKE ST. CHICAGO

electric test domes, "running in" racks, dehydrating oven, spray booth and equipment, paint stripping assemblies, automatic lapping wheels, grinders, control testing apparatus, pressure coil cleaning equipment, float calibrating mechanisms, test cabinets, leak detecting baths, acetylene welding, electric arc welding, converters for d.c. and a.c. current, refrigerant gas racks, expansion valve testing equipment, motor testing apparatus, arbor press, compressor quiet room, and many other pieces of standard and special equipment enable them to repair properly, test and refinish any refrigeration part or unit.

The stockroom and general offices occupy the entire first floor and general storage, heavy machinery and display, occupy the basement.

Refrigeration Maintenance Corporation, which was organized in 1930, is one of the largest in the country, and has the most modern type of equipment and largest stock in this line of business.

\$\$\$

THE MUELLER DUAL RELIEF VALVE

THE new Mueller Brass Co. Dual Relief Valve Assembly provides a low cost method of installing two relief valves in parallel. It is impossible to shut off both valves at one time, but the supply to either one or the other may be shut off to permit servicing or removal of either of the two valves.

The Dual Relief Valve Assembly provides the best possible insurance against loss of refrigerant—a serious matter at any time, but exceptionally so with the larger systems.

In operation the relief line from the refrigeration system is connected to the inlet and the relief to the atmosphere is connected to the outlet. Two relief valves are installed in the by-pass valve. By back seating the by-pass valve, No. 1 relief valve is thrown into the system. By front seating the by-pass valve, relief valve No. 2 is thrown into the system. If the by-pass valve is left in a neutral position, both valves are in operation.

If one of the relief valves should become defective or fail to reseat properly after being opened, the second relief valve may be thrown into the system by proper adjustment of the by-pass valve and the defective valve may be removed for repair or replacement.

The by-pass valve is made of forged brass with a specially treated steel stem. The relief valves incorporated in the assembly have all the advantageous features of the Mueller

Brass Co. line of time-tested and approved relief valves.

This dual relief valve has been approved by the code authorities of all the cities to which it has been submitted.

MARSDEN & WASSERMAN ADD GILMER BELTS

MARSDEN & Wasserman, Inc., have been appointed jobbers by the L. H. Gilmer Co., Philadelphia. They will distribute Gilmer belts in the Hartford, Conn. area, through their Refrigeration Department in charge of Mr. J. Simons.

GENERAL CONTROLS OPENS NEW OFFICE IN DETROIT

EXPANDING its service and sales facilities, General Controls Company has opened a new division office in Detroit. It is located at 6432 Cass Ave. and is under the direction of A. F. Read, graduate engineer.

The company manufactures a complete line of electrical control instruments, including thermostats, magnetic valves and heater controls.

M-H LAUNCHES CAMPAIGN TO AROUSE INTEREST IN NEW TYPE HEATING

RECENT nation-wide inquiries through its branch offices have convinced the Minneapolis-Honeywell Regulator Company that the public is not yet aware of the improvements in automatic heating equipment of all types.

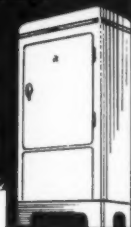
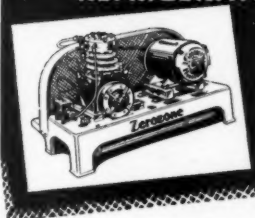
With this in mind, Minneapolis-Honeywell is launching a fall consumer campaign, starting with a full page advertisement in *The Saturday Evening Post* and *Time Magazine*.

This advertisement will be followed by a series, running throughout the fall, of large space advertisements on this subject and its relation to automatic control.

In the words of H. W. Sweatt, president of Minneapolis-Honeywell Regulator Company, "It is our earnest hope that these advertisements and this campaign will do their bit in arousing public attention and impress home-owners everywhere with the fact that this new, effortless, indoor, winter comfort is quickly and easily available, both for modernizing and for complete new installations."

SERVICE ENGINEER

QUICK SERVICE On Genuine Parts for **Zerozone** Household & Commercial REFRIGERATION



Take no chances with unauthorized ZEROZONE parts of doubtful quality. Buy direct from the ZEROZONE factory. Get only genuine parts, exactly as used in famous ZEROZONE units. Quality materials engineered to fit and operate smoothly. Save service complaints. Quick service on all parts ordered.

Zerozone Refrigeration Company
SIDNEY, OHIO

WILLIAMS & CO., Inc.

Refrigeration Supply Jobbers

PITTSBURGH

CLEVELAND

CINCINNATI

Extend Best Wishes
to All Members of the
5th Annual Convention

In CANADA

EXCLUSIVE—

We handle the following lines in Canada on an exclusive basis: Chieftain, Mills, D. F. N., Ranco, Peerless, Temprite. In addition we carry Kerotest, Rotary Seals, Henry Driers, Etc. Write for our latest catalog.

**REFRIGERATION
SUPPLIES CO., LTD.**
LONDON • ONTARIO

OFN

SYSTEM

Dehydrators
Filters
Neutralizers
Strainers

•
Wishing the
R. S. E. S.
•
Continued Success

McINTIRE CONNECTOR CO.

Newark

New Jersey

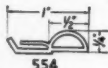
SHIPPED THE SAME DAY

BABBITT
BRONZE BEARINGS
BRONZE BUSHINGS
BRONZE HAMMERS
BRUSH HOLDERS
BRUSH SEATING STONES
CARBON BRUSHES
CARBON CONTACTS
CARBON PLATES
COMMUTATOR FILES
COMMUTATOR STONES

COPPER CONTACTS
ELECTRIC PORTABLE
BLOWERS
ELECTRIC SOLDERING
POTS
FELT WICKING
FIBRE WASHERS
INDUSTRIAL VACUUM
CLEANERS
SHUNT TERMINALS
SHUNT WIRE

WM. F. MAGUIRE CO.
ELECTRICAL SPECIALTIES
128 No. Clinton St. Tel. Randolph 9117
CHICAGO

Jarrow Replacement Door Gaskets



554

The gasket illustrated was made especially for Majestic replacement. It fits. ALL JARROW gaskets are built to Manufacturers' original specifications. Insist on JARROW GASKETS.

JARROW PRODUCTS CORPORATION
420 N. LaSalle St., Chicago, Ill.

KENMORE MOVES TO NEW QUARTERS

THE Kenmore Machine Products, Inc., manufacturers of Kenmore oil separators and high side floats, have just moved from Buffalo, N. Y., to a new and larger plant at Lyons, N. Y.

This new plant provides three times the floor space for manufacturing Kenmore products and contract machine work. The plant is located on the main line of the New York Central, 35 miles east of Rochester, and has private siding for convenience in shipping.

J. A. Smith is general manager and G. W. Smith is in charge of engineering and sales.

MELCHIOR, ARMSTRONG, DESSAU CO. OPENS NEW BRANCH

ANNOUNCEMENT was made recently of the opening of a new branch office and warehouse at 2709 Penn Ave., Pittsburgh, Pa., by Melchior, Armstrong, Dessau Co.

The new branch will be in charge of C. Vance Hale, formerly of Boston, Mass. A large stock of refrigeration, heating and air conditioning supplies will be carried at this new location, and plenty of parking space is provided.

On October 15, another branch will be opened at 246 Washington Ave., Albany, N. Y., where another large stock of supplies will be carried.

The company has ten other similar units along the Eastern Seaboard.

H. V. HIGLEY ELECTED PRESIDENT OF ANSUL

SUCCESSING Mr. F. G. Hood, founder and President of Ansul Chemical Co., who died suddenly on August 9, Mr. H. V. Higley, formerly Secretary-Treasurer, was elected President of the Company at a meeting of the stockholders September 1.

Mr. F. J. Hood, son of the former president, was elected Secretary-Treasurer and a Director of the Company, filling the post occupied by Mr. Higley.

Mr. Higley, who was formerly connected with the Isko Company in the position of Chief Chemist, became associated with Mr. Hood and the Ansul Company shortly after the World War. He is credited with having a large share in focusing the attention of the Company on the advancement of sulphur

dioxide as a refrigerant. Previous to that time, the Company made sulphur dioxide for use in textile and bleaching industries, and for the preservation of fruits.

\$\$\$

AUSTIN JONES APPOINTED REPRESENTATIVE FOR ELECTRIMATIC CORP.

MR. AUSTIN JONES, manufacturers' representative in the states of Nebraska, Iowa, Minnesota, North and South Dakota, was recently appointed representative for The Electrimatic Corp., of Chicago, Ill., who are makers of a line of pres-



AUSTIN JONES

sure-operated water valves, solenoid valves, suction pressure regulators, etc.

Mr. Jones is the only manufacturers' representative working exclusively on refrigeration and air conditioning supplies in the states mentioned. He has been engaged in this territory since 1934, and has been doing an exceptionally good job for the manufacturers.

In addition to this newly-appointed line, Mr. Jones is also representative for Chicago Metal Hose Co., Clendenin Bros., Marshalltown Manufacturing Co., Motor Equipment Co., Osoite Co., Rotary Seal Co., United Wire & Supply Corp., and Virginia Smelting Co.

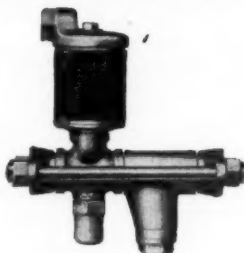
\$\$\$

NEW ROOM THERMOSTATS INTRODUCED BY AUTOMATIC PRODUCTS COMPANY

THE unusual combination of beauty and efficiency shown in the new A-P 88 Series Room Thermostats has already

SERVICE ENGINEER

ELECTRICALLY OPERATED SHUT-OFF VALVES



TYPE EF

for

FREON—METHYL—SULPHUR

Send for Catalog

THE ELECTRIMATIC CORP.
2100 INDIANA AVE., CHICAGO, ILL.

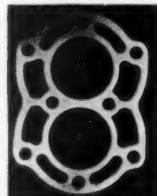
LET'S GO TO BUFFALO!

It will be a great pleasure for me to again meet my fellow members of the R.S.E.S. at the Buffalo convention.

E. P. Sorensen, President

UTILITIES ENGINEERING INSTITUTE
404 N. Wells St. 17 W. 60th St.
Chicago, Ill. New York, N. Y.

ORIGINAL REPLACEMENT GASKETS



for all makes of compressors. Send for new bulletin No. 40

CHICAGO-WILCOX MFG. CO.
7701 S. AVALON AVE., CHICAGO, ILL.

A New Book!

**How to install, service, and repair
all types of household refrigerators.**

This book presents everything needed by the man who is servicing electric refrigerators, from a simple explanation of how they work to detailed, practical methods and data on installation, testing, servicing, adjusting, trouble-shooting, repairing, etc.



Household Electric Refrigeration

Including Gas Absorption System

By Wostrel and Praetz

406 pages, illustrated, \$4.00

A practical manual for installation and refrigeration service men, giving descriptions and illustrations of many popular makes of machines, showing both the entire system and details of parts, and emphasizing the basic points of construction and operation. Besides the step-by-step descriptive material, numerous charts and tables giving reference information in handy form make this a practical book.

Nickerson & Collins Co.

435 N. Waller Ave., Chicago

prompted comments of "The Most Beautiful Thermostat on the Market." Designed by Barnes & Reincke, famous artist designers, the new thermostats offer several distinctive and different features. The case or cover is beautifully modern in softly rounded design. Thermometer is recessed for protection against breakage and for added attractiveness. Cover louvers have been eliminated and, instead, air is circulated between the base and bottom of the cover. This is a great improvement in appearance over the customary cover design.

The new thermostats offer quick cycling temperature control for either high or low voltage installation, with or without "Heat Anticipator." They can be used for heating and cooling, or heating or cooling. The new "Heat Anticipator" assures unusually accurate control of temperatures within a maximum variation of less than 2 degrees F.,



NEW A-P THERMOSTAT

with practically no "over-shooting." This means more healthful, more comfortable heat, and greater fuel efficiency.

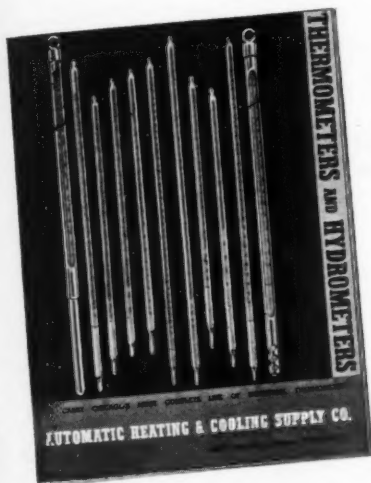
Several exclusive new A-P features will appeal particularly to dealers and installing engineers. The No. 88 HA, for instance, is rated at $\frac{1}{4}$ hp. R.I. and can be used with a $\frac{1}{4}$ hp. R.I. motor without the use of a relay. This simplifies installation on many applications such as a blower fan or a unit heater powered with $\frac{1}{4}$ hp. motor or less. Another new development is the separate terminal board mounting with spring pressure contacts. This provides quick and easy installation, for this separate terminal board may be mounted on the wall and wires attached in a fraction of the time usually required for this operation. Then the base and thermostat cover are merely snapped into place and the installation is complete.

Another interesting feature is the "Magnetic Blowout," which is a double magnet used to depress the arc at contact points. This insures against point pitting, a difficulty often found in thermostat operation, and affords longer service, better and more accurate temperature control.

The new A-P 88 Series Room Thermostats are available for use with standard furnace equipment, and will be offered also in a special sales unit, together with transformer, limit control and motor. They are also designed for use with oil burning space heaters in combination with a transformer and the A-P Electric Conversion Unit and Manual Constant Level Oil Control Valve.

NEW CATALOGS AND BULLETINS

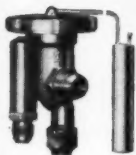
AUTOMATIC HEATING AND COOLING SUPPLY Co. has just issued a new bulletin showing the many types of thermometers carried by them. Listed in this bulletin, you will find thermometers for every purpose in refrigeration and air conditioning, and many special types used in other applications, such as:



WRITE FOR THIS BULLETIN

pointed bulb thermometers for testing temperatures of meats and doughs, pocket test thermometers, thermometers for ammonia and brine, straight and angle thermometers, mercury actuated dial thermometers, air duct thermometers, and many others. In addition,

Proof of Trouble-Free Service—No ALCO "TK" Thermo Valve Has Ever Lost Its Charge!



SINCE its introduction not a single "TK" valve has been returned because of power assembly failure. Alco "TK" Thermo Valves offer you all the proven advantages of the famous Alco "T" series valves at a saving of 20 to 40% in cost.

Ideal for small refrigeration and air conditioning systems, Alco "TK" Thermo Valves deliver accurate, trouble-free service throughout their long life. Details include atomic hydrogen welded power assembly, large, adequate filter area, light weight and simple design, yet as sturdy as larger valves.

See your jobber for complete information and specifications.

ALCO VALVE COMPANY, INC.

2630 Big Bend Blvd.
St. Louis, Mo.



Engineered Refrigerant
Controls for
Highest Evaporator Efficiency

tion, the bulletin lists hydrometers for measuring the density of salt and calcium brines.

Automatic Heating and Cooling Supply Co. carries the largest stock of thermometers in America. In addition, they are equipped to render the most efficient service on the thermometers you are now using.

Write the Company, at 647 W. Lake St., Chicago, Ill., for a copy of this bulletin.

RANCO, INC., have just issued the second revision of their manual covering commercial temperature and pressure controls, and exact replacement domestic controls.

The manual contains 152 pages of very useful information for every refrigeration service engineer in the field. In it is contained complete instruction for the proper installation, adjustment and repair of every type of control manufactured by Ranco, Inc. Of greatest value to the service engineer is the chart, which shows the correct "cut-in" and "cut-out" temperatures for various types of systems and evaporators.

Your copy may be obtained by writing the Company at Columbus, Ohio.

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"Jitterbug"

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Repeated tests show that the Arco Copper-to-Copper Connection stays tight and leakproof despite constant vibration.

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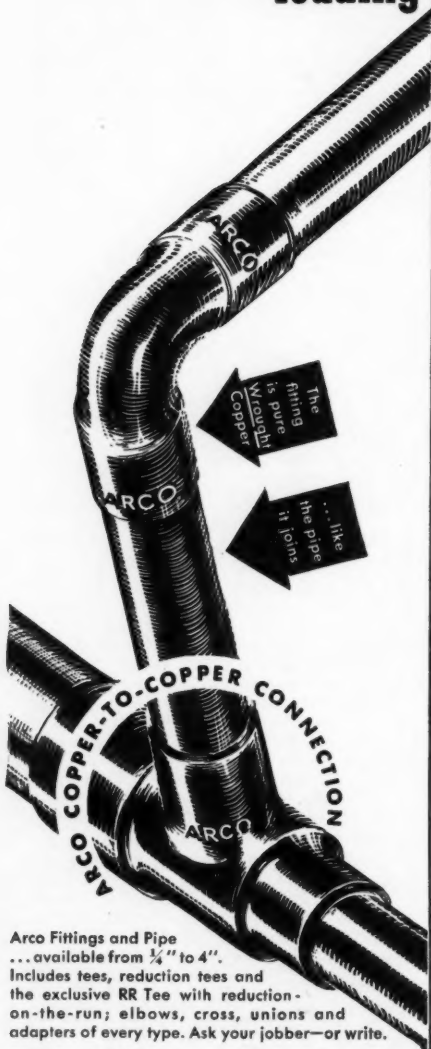
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The Arco Copper-to-Copper Connection is quick and simple. It needs no tinning ... no complicated machining. Fittings and pipe heat rapidly and at the same rate. The tightness of the joint may easily be checked while it is being made.

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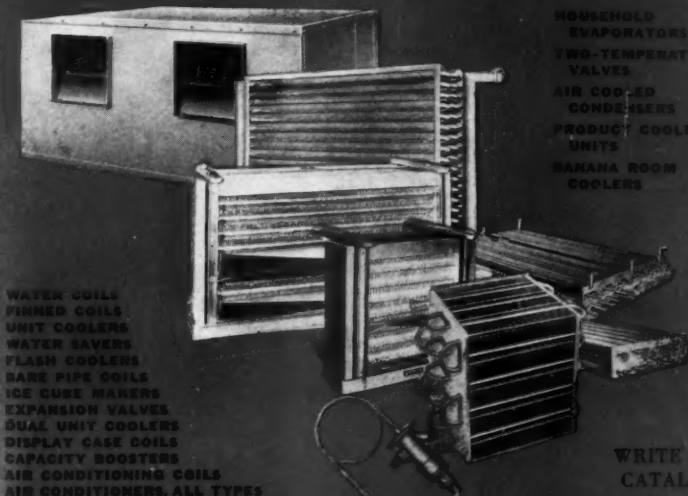
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